United States Department of Agriculture

Natural Resources Conservation Service

In cooperation with the University of Nebraska, Conservation and Survey Division; the Lower Platte North Natural Resources District; the Lower Platte South Natural Resources District; and the Saunders County Board of Commissioners

Soil Survey of Saunders County, Nebraska

How To Use This Soil Survey

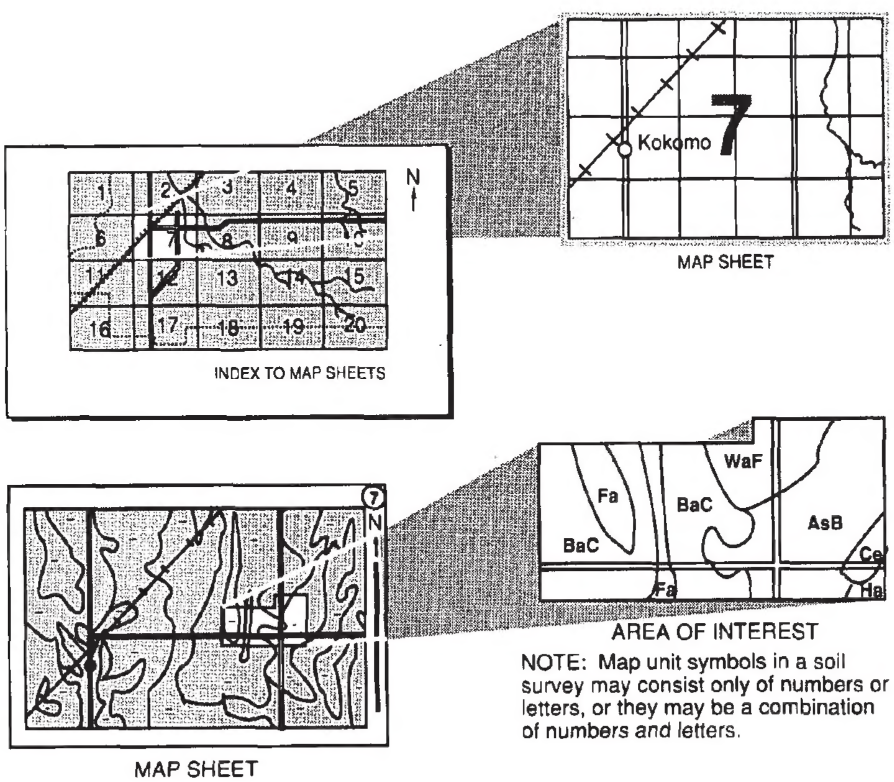
Detailed Soil Maps

The detailed soil maps can be useful in planning the use and management of small areas.

To find information about your area of interest, locate that area on the **Index to Map Sheets**. Note the number of the map sheet and turn to that sheet.

Locate your area of interest on the map sheet. Note the map unit symbols that are in that area. Turn to the **Contents**, which lists the map units by symbol and name and shows the page where each map unit is described.

The **Contents** shows which table has data on a specific land use for each detailed soil map unit. Also see the **Contents** for sections of this publication that may address your specific needs.



NOTE: Map unit symbols in a soil survey may consist only of numbers or letters, or they may be a combination of numbers and letters.

This soil survey is a publication of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (formerly the Soil Conservation Service) has leadership for the Federal part of the National Cooperative Soil Survey.

Major fieldwork for this soil survey was completed in 1993. Soil names and descriptions were approved in 1993. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 1993. This survey was made cooperatively by the Natural Resources Conservation Service and the University of Nebraska, Conservation and Survey Division. The survey is part of the technical assistance furnished to the Lower Platte North and the Lower Platte South Natural Resources Districts, and the Saunders County Board of Commissioners.

Soil maps in this survey may be copied without permission. Enlargement of these maps, however, could cause misunderstanding of the detail of mapping. If enlarged, maps do not show the small areas of contrasting soils that could have been shown at a larger scale.

Cover: A dam located in western Saunders County provides flood protection to downstream villages and cropland. It also provides recreational facilities for local residents. Terraces and grassed waterways in the areas surrounding the dam reduce the hazard of erosion and help to keep runoff water clean.

Additional information about the Nation's natural resources is available on the Natural Resources Conservation Service homepage on the World Wide Web. The address is http://www.nrcs.usda.gov.

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Foreword

This soil survey contains information that affects land use planning in this survey area. It contains predictions of soil behavior for selected land uses. The survey also highlights soil limitations, improvements needed to overcome the limitations, and the impact of selected land uses on the environment.

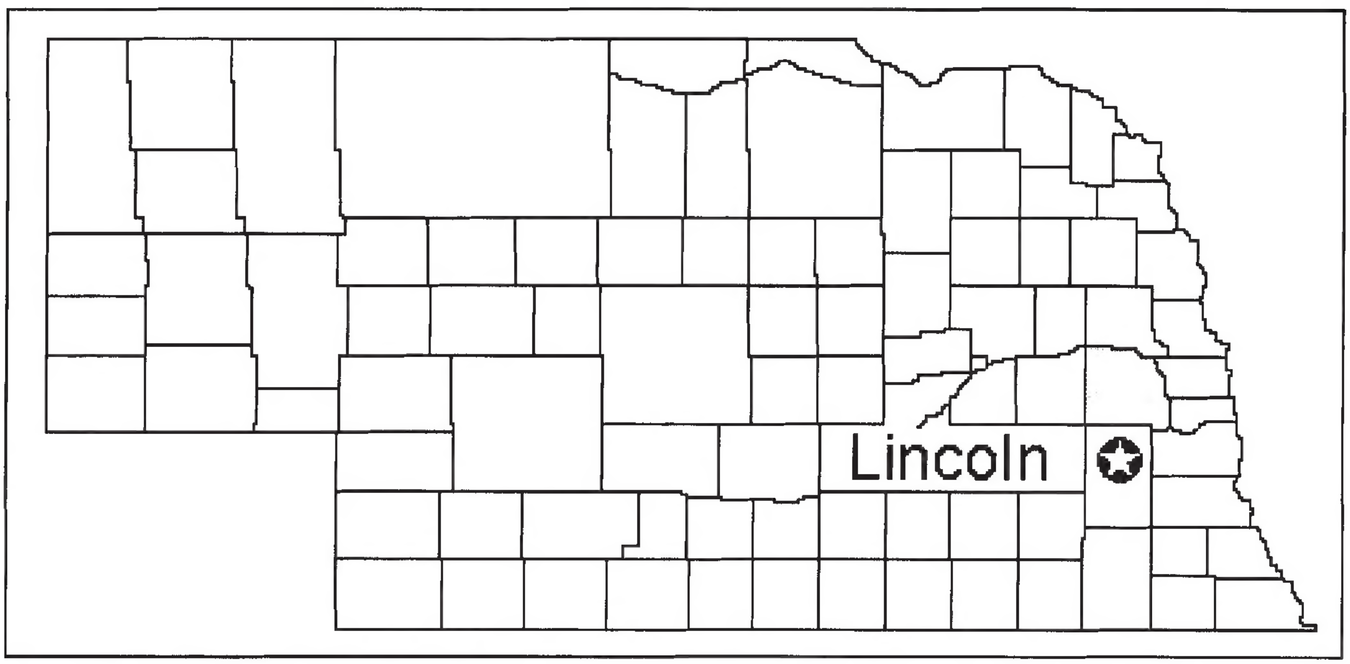
This soil survey is designed for many different users. Farmers, ranchers, foresters, and agronomists can use it to evaluate the potential of the soil and the management needed for maximum food and fiber production. Planners, community officials, engineers, developers, builders, and home buyers can use the survey to plan land use, select sites for construction, and identify special practices needed to ensure proper performance. Conservationists, teachers, students, and specialists in recreation, wildlife management, waste disposal, and pollution control can use the survey to help them understand, protect, and enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. The information in this report is intended to identify soil properties that are used in making various land use or land treatment decisions. Statements made in this report are intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are shallow to bedrock. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

These and many other soil properties that affect land use are described in this soil survey. The location of each soil is shown on the detailed soil maps. Each soil in the survey area is described, and information on specific uses is given. Help in using this publication and additional information are available at the local office of the Natural Resources Conservation Service or the Cooperative Extension Service.

Stephen K. Chick
State Conservationist
Natural Resources Conservation Service



Location of Saunders County in Nebraska.

Soil Survey of Saunders County, Nebraska

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United States Department of Agriculture, Natural Resources Conservation Service, in cooperation with
the University of Nebraska, Conservation and Survey Division; the Lower Platte North Natural Resources District; the Lower Platte South Natural Resources District; and the Saunders County Board of Commissioners

SAUNDERS COUNTY is located in the northern part of Major Land Resource Area 106—Nebraska and Kansas Loess-Drift Hills, which is in the Central Feed Grains and Livestock Region (USDA, 1981). It is in east-central Nebraska. The total area of the county is about 759 square miles, or 485,709 acres.

Saunders County is bordered on the north and east by the Platte River. It is bordered by Lancaster and Cass Counties on the south, Douglas and Sarpy Counties on the east, Dodge County on the north, and Butler County on the west.

General Nature of the County

The following paragraphs give general information about Saunders County. They describe physiography, relief, and drainage; climate; geology and ground water; and history and development.

In 2000, Saunders County had a population of 19,830. Wahoo is the county seat with a population of 3,940. It is the largest town in Saunders County. There are 14 other incorporated towns in the county, most of which have services that are agriculture related.

The first soil survey of Saunders County was published in 1915 (USDA, 1915); another soil survey was published in 1965 (USDA, 1965). This new survey updates the earlier surveys, provides additional information, includes maps that can be digitized for computer use, and presents the soils in more consistent detail.

About 85 percent of the county is used as cropland, and 7 percent is used for pasture or rangeland. About 2 percent is forestland. The remaining area consists of farmsteads, towns, or water. Corn is the principal crop. It is grown successfully in nonirrigated as well as irrigated areas. About 13 percent of the cropland is irrigated. Soybeans, wheat, grain sorghum, and alfalfa are the other major crops in the county. These crops are used as feed for cattle and hogs, and they provide cash income.

A business selling rock quarried near Ashland and sand and gravel suitable for construction (obtained along the Platte River) is one economic enterprise in the county. Most employment in Saunders County is in agriculture or related business.

Physiography, Relief, and Drainage

There are three major physiographic divisions in Saunders County: the uplands (formed in loess and glacial till); the alluvial terraces (deposited at a time when the streams were flowing at a higher level); and the flood plain soils (formed in recent alluvium of the Platte River and Wahoo and Salt Creeks and their tributaries).

Elevations range from 1,060 feet in the southeastern part of the county to about 1,630 feet in the northwestern part of the county. Wahoo is at an elevation of 1,220 feet. The general slope of Saunders County is southeastward.

The upland soils are mostly well drained and the relief is dominantly gently sloping to strongly sloping. The southwestern part of the county is dominantly strongly sloping to moderately steep. A large alluvial terrace, known as the Todd Valley, formed when loess capped the sandy, alluvial sediments of an ancient river. Most of these soils are well drained and are nearly level to very gently sloping. There are areas of

concave swales and potholes that are somewhat poorly drained and poorly drained. The flood plain soils are nearly level and are dominantly moderately well drained and somewhat poorly drained. Wetness and lowland flooding are hazards during the spring along the flood plains.

Drainage is chiefly southeastward through Wahoo Creek and its principal tributaries, Dunlap, Cottonwood, Duck, and Sand Creeks and Miller Branch. Rock Creek and Oak Creek drain the southern and southwestern parts of the county. These creeks flow southward and empty into Salt Creek in Lancaster County. Wahoo Creek flows into Salt Creek just north of Ashland, and Salt Creek flows into the Platte River east of Ashland near the southeastern corner of the county. The small drainageways along the bluffs in the northern and eastern parts of the county drain directly into the Platte River.

Climate

Table 1 gives data on temperature and precipitation for the survey area as recorded at Mead Agronomy Lab in the period 1970 to 1990. Table 2 shows probable dates of the first freeze in fall and the last freeze in spring. Table 3 provides data on length of the growing season.

In winter, the average temperature is 24 degrees F and the average daily minimum temperature is 13 degrees. The lowest temperature on record, which occurred at Mead Agronomy Lab on January 12, 1974, is -35 degrees. In summer, the average temperature is 74 degrees and the average daily maximum temperature is 87 degrees. The highest recorded temperature, which occurred at Mead Agronomy Lab on June 22, 1988, is 108 degrees.

The average annual total precipitation is about 27.01 inches. Of this total, about 19.66 inches, or 73 percent, usually falls in April through September. The growing season for most crops falls within this period. The heaviest 1-day rainfall during the period of record was 5.25 inches at Mead Agronomy Lab on July 26, 1990. Thunderstorms occur on about 46 days each year, and most occur in July.

The average seasonal snowfall is about 19.2 inches. The greatest snow depth at any one time during the period of record was 11 inches. On the average, 8 days of the year have at least 1 inch of snow on the ground. The heaviest 1-day snowfall on record was 8 inches.

The average relative humidity in midafternoon is about 58 percent. Humidity is higher at night, and the average at dawn is about 82 percent. The sun shines 72 percent of the time possible in summer and 56 percent in winter. The prevailing wind is from the south-southeast. Average windspeed is highest, 12 miles per hour, in April.

Geology and Ground Water

All exposed earth materials in Saunders County are unconsolidated deposits of Quaternary age. Ranging in thickness from about 10 to 200 feet, these deposits are loess (wind-deposited silt), till (unsorted rock debris left behind when continental ice sheets melted back after extending over eastern Nebraska), and alluvium (water-deposited sand, silt, clay, or gravel) deposited by ancient and modern streams. The Quaternary deposits rest on bedrock of Late Cretaceous age. Some small areas of sandstone of the Dakota Group of Cretaceous age are exposed in the southern part of Saunders County.

Loess is the most extensive surficial deposit on the uplands and blankets till throughout most of the county. In the southwestern part of the county, most of the loess has been removed, exposing the underlying till. In the northeastern part of the county, in an area known as the Todd Valley, 6 to 25 feet of loess overlies Todd Valley sand of alluvial or aeolian origin.

The original loess mantle has been removed entirely in the Platte River Valley. The material presently consists of sediment (alluvium) deposited by the upland drainageways that flow into the Platte River and of alluvium deposited by the Platte River.

Water for domestic, municipal, and livestock use is supplied from wells. Farm ponds supplement the supply for livestock in areas where well yields are small. Yields range from small, where the water-bearing material consists entirely of till, to large (more than 1,000 gallons per minute), where the water-bearing sand and sandy gravel formation is many feet thick. Irrigation wells are most common in the Todd Valley and in the Platte River Valley. In the remaining areas of the county, yields are generally less than 50 gallons per minute.

History and Development

The Otoe Indians lived in the territory that is now Saunders County before the first pioneers settled north of Ashland in 1856.

A portion of the Oxbow Trail, used by pioneers in the mid-1850s, traverses across the southern part of Saunders County.

The county was organized in 1867, and after several changes the boundaries were fixed (as they currently exist) by legislation approved in 1875. The

county seat was originally Ashland, but it was moved to Wahoo on October 14, 1873. The population increased rapidly during the late 1800s, when German, Swedish, and Bohemian immigrants settled the county.

It is believed the Otoe Indians were responsible for the origin of the name "Wahoo," meaning "burning bush." Burning bushes grew in abundance along nearby creek banks.

The early settlers plowed their land and grew corn, wheat, and garden crops for home use. When transportation facilities opened up new markets, farmers were able to sell some of their products. As demand for agricultural products changed, new crops were introduced into the area.

Currently, most of the area of Saunders County is used for agriculture. Some permanent and recreational housing areas are being developed around old abandoned gravel pits along the Platte River. A large portion of the population of Saunders County is employed outside of the county in the metropolitan areas of Fremont, Omaha, and Lincoln.

How This Survey Was Made

This survey was made to provide information about the soils and miscellaneous areas in the survey area. The information includes a description of the soils and miscellaneous areas and their location and a discussion of their suitability, limitations, and management for specified uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They dug many holes to study the soil profile, which is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity (Hartung and others, 1991).

The soils and miscellaneous areas in the survey area are in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept or model of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are

predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Detailed Soil Map Units

The map units delineated on the detailed soil maps in this survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions in this section, along with the maps, can be used to determine the suitability and potential of a unit for specific uses. They also can be used to plan the management needed for those uses.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. The contrasting components are mentioned in the map unit descriptions. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Pohocco silty clay loam, 5 to 11 percent slopes, eroded, is a phase of the Pohocco series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes. A *soil complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Yutan, eroded-Aksarben silty clay loams, 2 to 5 percent slopes, is an example.

This survey includes *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. The map unit Gravel pits is an example.

In the descriptions, "LEP" means linear extensibility percent. Definitions of the ecological sites listed in the descriptions are provided in the Field Office Technical

Guide, which is available in local offices of the Natural Resources Conservation Service.

Table 4 gives the acreage and proportionate extent of each map unit. Other tables (see Contents) give properties of the soils and the limitations, capabilities, and potentials for many uses. The Glossary defines many of the terms used in describing the soils or miscellaneous areas.

1050—Aksarben silty clay loam, 0 to 2 percent slopes

Map Unit Composition

Aksarben: 98 percent
Minor components: 2 percent

Component Descriptions

Aksarben

Landform: Broad interstream divides on uplands
Parent material: Loess
Slope: 0 to 2 percent
Drainage class: Well drained
Slowest permeability: Moderately slow (about 0.20 inch per hour)
Available water capacity: High (about 10.7 inches)
Shrink-swell potential: Moderate (about 4.5 LEP)
Flooding hazard: None
Depth to seasonal zone of saturation: More than 6 feet
Surface runoff class: Low
Ecological site: Silty; Veg. Zone 4
Land capability (irrigated): 1
Land capability (nonirrigated): 1

Typical profile:
Ap—0 to 6 inches; silty clay loam
A—6 to 12 inches; silty clay loam
Bt1—12 to 18 inches; silty clay loam
Bt2—18 to 26 inches; silty clay loam
Bt3—26 to 34 inches; silty clay loam
Bt4—34 to 42 inches; silty clay loam
BC—42 to 60 inches; silty clay loam
C—60 to 80 inches; silt loam

Similar soils: Soils that are dark to a depth of more than 24 inches

Minor components

Fillmore
Extent: About 2 percent of the unit
Slope: 0 to 1 percent
Drainage class: Somewhat poorly drained
Ecological site: Clayey Overflow; Veg. Zone 4

General Considerations

• This map unit occurs on nearly level summits on the highest part of the landform.
• Most of the acreage of this unit is used for cultivated crops.

1100—Alda fine sandy loam, occasionally flooded

Map Unit Composition

Alda: 85 percent
Minor components: 15 percent

Component Descriptions

Alda

Landform: Flood plains in river valleys
Parent material: Loamy alluvium over sandy and gravelly alluvium
Slope: 0 to 2 percent
Drainage class: Somewhat poorly drained
Slowest permeability: Moderate (about 0.60 inch per hour)
Available water capacity: Moderate (about 6.1 inches)
Shrink-swell potential: Low (about 1.5 LEP)
Flooding frequency: Occasional
Depth to seasonal zone of saturation: About 18 to 36 inches
Surface runoff class: Low
Ecological site: Subirrigated; Veg. Zone 4
Land capability (irrigated): 3w
Land capability (nonirrigated): 3w

Typical profile:
A—0 to 11 inches; fine sandy loam
AC—11 to 17 inches; fine sandy loam
C—17 to 29 inches; fine sandy loam
2Cg1—29 to 34 inches; coarse sand
2Cg2—34 to 80 inches; stratified coarse sand to gravelly sand

Similar soils: Soils that contain more clay in the profile

Minor components

Wann
Phase: Occasionally flooded
Extent: About 10 percent of the unit
Slope: 0 to 2 percent
Drainage class: Somewhat poorly drained
Ecological site: Subirrigated; Veg. Zone 4

Platte
Phase: Occasionally flooded

Extent: About 3 percent of the unit
Slope: 0 to 2 percent
Drainage class: Somewhat poorly drained

Barney
Phase: Frequently flooded
Extent: About 2 percent of the unit
Slope: 0 to 2 percent
Drainage class: Poorly drained
Ecological site: Wetland; Veg. Zone 3

General Considerations

• Most of the acreage of this unit is used for cultivated crops. The rest is used for pasture or mowed for hay.
• The hazard of soil blowing is severe.
• If this unit is irrigated, sprinkler irrigation is best suited because frequent and light applications of irrigation water are needed. Excess water leaches plant nutrients and pesticides below the plant roots.

1347—Barney silty clay loam, wet, frequently flooded

Map Unit Composition

Barney: 87 percent
Minor components: 13 percent

Component Descriptions

Barney

Landform: Flood plains in river valleys
Parent material: Loamy alluvium over sandy and gravelly alluvium
Slope: 0 to 2 percent
Drainage class: Poorly drained
Slowest permeability: Moderate (about 0.60 inch per hour)
Available water capacity: Low (about 3.6 inches)
Shrink-swell potential: Low (about 1.5 LEP)
Flooding frequency: Frequent
Depth to seasonal zone of saturation: About 0 to 24 inches
Surface runoff class: Very low
Ecological site: Wetland; Veg. Zone 3
Land capability (nonirrigated): 6w

Typical profile:
A—0 to 7 inches; silty clay loam
ACg—7 to 10 inches; loam
Cg1—10 to 30 inches; fine sand
Cg2—30 to 80 inches; coarse sand

Minor components

Platte
Phase: Frequently flooded
Extent: About 9 percent of the unit
Slope: 0 to 2 percent
Drainage class: Somewhat poorly drained

Fluvaquents
Extent: About 4 percent of the unit
Slope: 0 to 1 percent
Drainage class: Very poorly drained

General Considerations

• All of the acreage of this unit supports native grasses and is used for pasture or mowed for hay.

1616—Boel loamy fine sand, occasionally flooded

Map Unit Composition

Boel: 85 percent
Minor components: 15 percent

Component Descriptions

Boel

Landform: Flood plains in river valleys
Parent material: Sandy alluvium
Slope: 0 to 3 percent
Drainage class: Somewhat poorly drained
Slowest permeability: Rapid (about 5.95 inches per hour)
Available water capacity: Low (about 5.1 inches)
Shrink-swell potential: Low (about 1.5 LEP)
Flooding frequency: Occasional
Depth to seasonal zone of saturation: About 18 to 36 inches
Surface runoff class: Very low
Ecological site: Subirrigated; Veg. Zone 4
Land capability (irrigated): 4w
Land capability (nonirrigated): 4w

Typical profile:
A—0 to 11 inches; loamy fine sand
AC—11 to 15 inches; fine sandy loam
C—15 to 60 inches; stratified fine sand, stratified loamy fine sand, stratified coarse sand

Minor components

Inglewood
Phase: Rarely flooded

Extent: About 7 percent of the unit
Slope: 0 to 3 percent
Drainage class: Moderately well drained
Ecological site: Sandy Lowland; Veg. Zone 4

Alda
Phase: Occasionally flooded
Extent: About 6 percent of the unit
Slope: 0 to 2 percent
Drainage class: Somewhat poorly drained
Ecological site: Subirrigated; Veg. Zone 4

Barney
Phase: Frequently flooded
Extent: About 2 percent of the unit
Slope: 0 to 2 percent
Drainage class: Poorly drained
Ecological site: Wetland; Veg. Zone 3

General Considerations

• Most of the acreage of this unit is used for pasture or mowed for hay. A small acreage is used for cultivated crops. Most areas that were cultivated have been reseeded to grass.
• The hazard of soil blowing is severe.
• If this unit is irrigated, sprinkler irrigation is best suited because frequent and light applications of irrigation water are needed. Excess water leaches plant nutrients and pesticides below the plant roots.

1873—Burchard-Steinauer clay loams, 6 to 12 percent slopes, eroded

Map Unit Composition

Burchard: 50 percent
Steinauer: 35 percent
Minor components: 15 percent

Component Descriptions

Burchard

Landform: Hillslopes on uplands
Hillslope position: Backslopes
Parent material: Calcareous till
Slope: 6 to 12 percent
Drainage class: Well drained
Slowest permeability: Moderately slow (about 0.20 inch per hour)
Available water capacity: High (about 9.5 inches)
Shrink-swell potential: Moderate (about 4.5 LEP)
Flooding hazard: None
Depth to seasonal zone of saturation: More than 6 feet
Surface runoff class: High
Ecological site: Silty; Veg. Zone 4
Land capability (nonirrigated): 4e

Typical profile:
A—0 to 13 inches; clay loam
Bt—13 to 19 inches; clay loam
Btk—19 to 29 inches; clay loam
Bk—29 to 37 inches; clay loam
C—37 to 60 inches; clay loam

Similar soils: Soils that have carbonates above a depth of 12 inches or below a depth of 30 inches; soils that contain more clay in the particle-size control section

Steinauer

Landform: Hillslopes on uplands
Hillslope position: Backslopes
Parent material: Calcareous loamy till
Slope: 6 to 12 percent
Drainage class: Well drained
Slowest permeability: Moderately slow (about 0.20 inch per hour)
Available water capacity: High (about 10.8 inches)
Shrink-swell potential: Moderate (about 4.5 LEP)
Flooding hazard: None
Depth to seasonal zone of saturation: More than 6 feet
Surface runoff class: High
Ecological site: Limy Upland; Veg. Zone 4
Land capability (nonirrigated): 4e

Typical profile:
Ap—0 to 6 inches; clay loam
AC—6 to 15 inches; clay loam
C1—15 to 41 inches; clay loam
C2—41 to 60 inches; clay loam

Similar soils: Soils that have carbonates lower in the profile; soils that contain more clay in the particle-size control section

Minor components

Morrill
Extent: About 8 percent of the unit
Landform: Hillslopes on uplands
Slope: 6 to 12 percent
Drainage class: Well drained
Ecological site: Silty; Veg. Zone 4

Malmo
Phase: Severely eroded
Extent: About 7 percent of the unit
Landform: Hillslopes on uplands
Slope: 6 to 12 percent
Drainage class: Moderately well drained

Ecological site: Clayey; Veg. Zone 4

General Considerations

• More than half of the acreage of this unit is used for cultivated crops or has been reseeded to native grasses. The rest is used for pasture or rangeland.
• The hazard of water erosion is severe. It can be controlled by contour farming, terraces, and conservation tillage.

1879—Burchard-Steinauer clay loams, 12 to 18 percent slopes, eroded

Map Unit Composition

Burchard: 45 percent
Steinauer: 40 percent
Minor components: 15 percent

Component Descriptions

Burchard

Landform: Hillslopes on uplands
Hillslope position: Backslopes
Parent material: Calcareous till
Slope: 12 to 18 percent
Drainage class: Well drained
Slowest permeability: Moderately slow (about 0.20 inch per hour)
Available water capacity: High (about 9.5 inches)
Shrink-swell potential: Moderate (about 4.5 LEP)
Flooding hazard: None
Depth to seasonal zone of saturation: More than 6 feet
Surface runoff class: High
Ecological site: Silty; Veg. Zone 4
Land capability (nonirrigated): 6e

Typical profile:
A—0 to 13 inches; clay loam
Bt—13 to 19 inches; clay loam
Btk—19 to 29 inches; clay loam
Bk—29 to 37 inches; clay loam
C—37 to 60 inches; clay loam

Similar soils: Soils that have carbonates above a depth of 12 inches or below a depth of 30 inches; soils that contain more clay in the particle-size control section

Steinauer

Landform: Hillslopes on uplands
Hillslope position: Backslopes
Parent material: Calcareous loamy till
Slope: 12 to 18 percent
Drainage class: Well drained
Slowest permeability: Moderately slow (about 0.20 inch per hour)
Available water capacity: High (about 10.8 inches)
Shrink-swell potential: Moderate (about 4.5 LEP)
Flooding hazard: None
Depth to seasonal zone of saturation: More than 6 feet
Surface runoff class: High
Ecological site: Limy Upland; Veg. Zone 4
Land capability (nonirrigated): 6e

Typical profile:
Ap—0 to 6 inches; clay loam
AC—6 to 15 inches; clay loam
C1—15 to 41 inches; clay loam
C2—41 to 60 inches; clay loam

Similar soils: Soils that have carbonates lower in the profile; soils that contain more clay in the particle-size control section

Minor components

Morrill
Extent: About 9 percent of the unit
Landform: Hillslopes on uplands
Slope: 12 to 18 percent
Drainage class: Well drained
Ecological site: Silty; Veg. Zone 4

Malmo
Phase: Severely eroded
Extent: About 6 percent of the unit
Landform: Hillslopes on uplands
Slope: 6 to 12 percent
Drainage class: Moderately well drained
Ecological site: Clayey; Veg. Zone 4

General Considerations

• Most of the acreage of this unit has been reseeded to native grasses or is used for pasture or rangeland.
•The hazard of water erosion is severe. It can be controlled by contour farming, terraces, and conservation tillage.

2420—Deroin silty clay loam, 5 to 11 percent slopes, eroded

Map Unit Composition

Deroin: 90 percent
Minor components: 10 percent

Component Descriptions

Deroin

Landform: Hillslopes on uplands
Hillslope position: Backslopes
Parent material: Loess
Slope: 5 to 11 percent
Drainage class: Well drained
Slowest permeability: Moderately slow (about 0.20 inch per hour)
Available water capacity: High (about 11.2 inches)
Shrink-swell potential: Moderate (about 4.5 LEP)
Flooding hazard: None
Depth to seasonal zone of saturation: More than 6 feet
Surface runoff class: Medium
Ecological site: Silty; Veg. Zone 4
Land capability (irrigated): 4e
Land capability (nonirrigated): 4e

Typical profile:
Ap—0 to 7 inches; silty clay loam
Bt1—7 to 12 inches; silty clay loam
Bt2—12 to 18 inches; silty clay loam
Bt3—18 to 40 inches; silty clay loam
BC—40 to 50 inches; silty clay loam
C—50 to 80 inches; silty clay loam

Similar soils: Soils that formed in yellowish brown loess; soils that have a dark surface layer more than 10 inches thick; soils that contain more clay in the particle-size control section

Minor components

Malmo
Phase: Severely eroded
Extent: About 10 percent of the unit
Landform: Hillslopes on uplands
Slope: 6 to 12 percent
Drainage class: Moderately well drained
Ecological site: Clayey; Veg. Zone 4

General Considerations

• The Deroin soil formed in Loveland loess.
• Most of the acreage of this unit is used for cultivated crops.
• The hazard of water erosion is severe. It can be controlled by contour farming, terraces, and conservation tillage.

2830—Filbert silt loam, 0 to 1 percent slopes

Map Unit Composition

Filbert: 90 percent
Minor components: 10 percent

Component Descriptions

Filbert

Landform: Depressions on stream terraces in valleys
Parent material: Loess
Slope: 0 to 1 percent
Drainage class: Somewhat poorly drained
Slowest permeability: Very slow (about 0.0015 inch per hour)
Available water capacity: Moderate (about 8.7 inches)
Shrink-swell potential: High (about 7.5 LEP)
Flooding hazard: None
Depth to seasonal zone of saturation: About 6 to 18 inches
Surface runoff class: Negligible
Ecological site: Clayey; Veg. Zone 4
Land capability (irrigated): 2w
Land capability (nonirrigated): 2w

Typical profile:
Ap1—0 to 5 inches; silt loam
Ap2—5 to 7 inches; silt loam
E1—7 to 12 inches; silt loam
E2—12 to 15 inches; silt loam
Bt1—15 to 25 inches; silty clay
Bt2—25 to 36 inches; silty clay
Bt3—36 to 43 inches; silty clay
Bt4—43 to 53 inches; silty clay
Bt5—53 to 62 inches; silty clay
Bt6—62 to 80 inches; silty clay loam

Minor components

Fillmore
Extent: About 6 percent of the unit
Slope: 0 to 1 percent
Drainage class: Somewhat poorly drained
Ecological site: Clayey Overflow; Veg. Zone 4

Tomek
Extent: About 4 percent of the unit
Slope: 0 to 1 percent
Drainage class: Well drained
Ecological site: Silty; Veg. Zone 4

General Considerations

• Most of the acreage of this unit is used for cultivated crops.
• In most years wetness is a problem.

2844—Fillmore silt loam, terrace, occasionally ponded

Map Unit Composition

Fillmore: 90 percent
Minor components: 10 percent

Component Descriptions

Fillmore

Landform: Playas on stream terraces in valleys
Parent material: Loess
Slope: 0 to 1 percent
Drainage class: Somewhat poorly drained
Slowest permeability: Very slow (about 0.0015 inch per hour)
Available water capacity: High (about 9.9 inches)
Shrink-swell potential: High (about 7.5 LEP)
Flooding hazard: None
Ponding frequency: Occasional
Depth to seasonal zone of saturation: About 0 to 24 inches
Surface runoff class: Negligible
Ecological site: Clayey Overflow; Veg. Zone 4
Land capability (irrigated): 4w
Land capability (nonirrigated): 3w

Typical profile:
A1—0 to 7 inches; silt loam
A2—7 to 14 inches; silt loam
E—14 to 22 inches; silt loam
Bt1—22 to 30 inches; clay
Bt2—30 to 42 inches; clay
Bt3—42 to 54 inches; silty clay
Bt4—54 to 62 inches; silty clay
Bt5—62 to 80 inches; silty clay

Minor components

Scott
Extent: About 8 percent of the unit
Slope: 0 to 1 percent
Drainage class: Very poorly drained

Tomek
Extent: About 2 percent of the unit
Slope: 0 to 1 percent
Drainage class: Well drained
Ecological site: Silty; Veg. Zone 4

General Considerations

• Most of the acreage of this unit is used for cultivated crops.
• In most years wetness or brief ponding are problems.

2863—Fluvaquents, silty, frequently flooded

Map Unit Composition

Fluvaquents: 95 percent
Minor components: 5 percent

Component Descriptions

Fluvaquents

Landform: Depressions on flood plains in river valleys
Parent material: Silty alluvium
Slope: 0 to 1 percent
Drainage class: Very poorly drained
Slowest permeability: Slow (about 0.06 inch per hour)
Available water capacity: High (about 10.8 inches)
Shrink-swell potential: Moderate (about 4.5 LEP)
Flooding frequency: Frequent
Ponding frequency: Frequent
Seasonal zone of saturation: At the surface
Surface runoff class: Negligible
Land capability (nonirrigated): 8w

Typical profile:
A—0 to 20 inches; silty clay
C—20 to 80 inches; stratified with various textures

Similar soils: Soils that have a loamy or sandy surface layer

Minor components

Kezan
Phase: Frequently flooded
Extent: About 5 percent of the unit
Slope: 0 to 2 percent
Drainage class: Poorly drained
Ecological site: Wet Subirrigated; Veg. Zone 4

General Considerations

• Areas of open water more than 6 inches deep are common in some places.
• All of the acreage of this unit is used for wetland wildlife habitat.

3025—Gibbon silt loam, occasionally flooded

Map Unit Composition

Gibbon: 95 percent
Minor components: 5 percent

Component Descriptions

Gibbon

Landform: Flood plains in river valleys
Parent material: Stratified calcareous silty alluvium
Slope: 0 to 2 percent
Drainage class: Somewhat poorly drained
Slowest permeability: Moderate (about 0.57 inch per hour)
Available water capacity: Very high (about 12.3 inches)
Shrink-swell potential: Moderate (about 4.5 LEP)
Flooding frequency: Occasional
Depth to seasonal zone of saturation: About 18 to 36 inches
Surface runoff class: Low
Ecological site: Subirrigated; Veg. Zone 4
Land capability (irrigated): 2w
Land capability (nonirrigated): 2w

Typical profile:
Ap—0 to 5 inches; silt loam
A—5 to 19 inches; silt loam
AC—19 to 24 inches; silt loam
Cg1—24 to 30 inches; silt loam
Cg2—30 to 42 inches; stratified very fine sandy loam to silt loam
Cg3—42 to 60 inches; stratified very fine sandy loam to silt loam

Minor components

Wann
Phase: Occasionally flooded
Extent: About 3 percent of the unit
Slope: 0 to 2 percent
Drainage class: Somewhat poorly drained
Ecological site: Subirrigated; Veg. Zone 4

Obert
Phase: Occasionally flooded
Extent: About 2 percent of the unit
Slope: 0 to 2 percent
Drainage class: Poorly drained
Ecological site: Wetland; Veg. Zone 4

General Considerations

• Most of the acreage of this unit is used for cultivated crops. Some of the acreage is used for pasture or mowed for hay.

• Some areas of this unit are irrigated if water is available.

3038—Gibbon-Saltine loams, occasionally flooded

Map Unit Composition

Gibbon: 50 percent
Saltine: 38 percent
Minor components: 12 percent

Component Descriptions

Gibbon

Landform: Flood plains in river valleys
Parent material: Stratified calcareous silty alluvium
Slope: 0 to 2 percent
Drainage class: Somewhat poorly drained
Slowest permeability: Moderate (about 0.57 inch per hour)
Available water capacity: Very high (about 12.3 inches)
Shrink-swell potential: Moderate (about 4.5 LEP)
Flooding frequency: Occasional
Depth to seasonal zone of saturation: About 18 to 36 inches
Surface runoff class: Low
Ecological site: Subirrigated; Veg. Zone 4
Land capability (irrigated): 2w
Land capability (nonirrigated): 2w

Typical profile:
Ap—0 to 5 inches; silt loam
A—5 to 19 inches; silt loam
AC—19 to 24 inches; silt loam
Cg1—24 to 30 inches; silt loam
Cg2—30 to 42 inches; stratified very fine sandy loam to silt loam
Cg3—42 to 60 inches; stratified very fine sandy loam to silt loam

Saltine

Landform: Flood plains in river valleys
Parent material: Silty alluvium
Slope: 0 to 2 percent
Drainage class: Somewhat poorly drained
Slowest permeability: Moderately slow (about 0.20 inch per hour)
Available water capacity: High (about 11.1 inches)
Shrink-swell potential: High (about 7.5 LEP)
Flooding frequency: Occasional
Depth to seasonal zone of saturation: About 18 to 36 inches
Surface runoff class: Low

Ecological site: Saline Subirrigated; Veg. Zone 4
Land capability (nonirrigated): 6s

Typical profile:
Ap—0 to 7 inches; silty clay loam
Bw1—7 to 12 inches; silty clay loam
Bw2—12 to 30 inches; silty clay loam
C1—30 to 48 inches; silty clay loam
C2—48 to 55 inches; silty clay loam
C3—55 to 60 inches; sandy clay loam

Minor components

Wann
Phase: Occasionally flooded
Extent: About 10 percent of the unit
Slope: 0 to 2 percent
Drainage class: Somewhat poorly drained
Ecological site: Subirrigated; Veg. Zone 4

Obert
Phase: Occasionally flooded
Extent: About 2 percent of the unit
Slope: 0 to 2 percent
Drainage class: Poorly drained
Ecological site: Wetland; Veg. Zone 4

General Considerations

• Most of the acreage of this unit is used for cultivated crops. Some of the acreage is used for pasture or mowed for hay.
• Some areas of this unit are irrigated if water is available.

3421—Hedville cobbly loam, 6 to 30 percent slopes

Map Unit Composition

Hedville: 80 percent
Minor components: 20 percent

Component Descriptions

Hedville

Landform: Hillslopes on uplands
Hillslope position: Shoulders and backslopes
Parent material: Residuum weathered from sandstone
Slope: 6 to 30 percent
Percent of surface covered by rock fragments: About 1 to 5 percent (subangular channers)
Depth to restrictive feature: 4 to 20 inches to bedrock (lithic)
Drainage class: Somewhat excessively drained
Slowest permeability: Moderate (about 0.60 inch per hour)
Available water capacity: Very low (about 2.0 inches)
Shrink-swell potential: Low (about 1.5 LEP)
Flooding hazard: None
Depth to seasonal zone of saturation: More than 6 feet
Surface runoff class: High
Ecological site: Shallow Sandy; Veg. Zone 4
Land capability (nonirrigated): 6s

Typical profile:
A—0 to 10 inches; cobbly loam
C—10 to 16 inches; cobbly loam
R—16 to 22 inches; bedrock

Similar soils: Soils that have a surface layer of loam or fine sandy loam

Minor components

Lancaster
Extent: About 10 percent of the unit
Landform: Hillslopes on uplands
Slope: 6 to 12 percent
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic)
Drainage class: Well drained
Ecological site: Silty; Veg. Zone 4

Rock outcrop
Extent: About 10 percent of the unit
Landform: Hillslopes on uplands
Slope: 11 to 30 percent
Ecological site: No Site; Veg. Zone 4

General Considerations

• The Hedville soil formed in residuum weathered from noncalcareous sandstone of the Dakota Formation. Sandstone fragments on the surface are common in some areas.
• All of the acreage of this unit is used for pasture or rangeland.

3830—Ida-Steinauer complex, 17 to 60 percent slopes

Map Unit Composition

Ida: 60 percent
Steinauer: 30 percent
Minor components: 10 percent

Component Descriptions

Ida

Landform: Hillslopes on uplands

Hillslope position: Backslopes
Parent material: Calcareous loess
Slope: 17 to 60 percent
Drainage class: Well drained
Slowest permeability: Moderate (about 0.60 inch per hour)
Available water capacity: Very high (about 12.4 inches)
Shrink-swell potential: Low (about 1.5 LEP)
Flooding hazard: None
Depth to seasonal zone of saturation: More than 6 feet
Surface runoff class: High
Ecological site: Thin Loess; Veg. Zone 4
Land capability (nonirrigated): 7e

Typical profile:
A—0 to 4 inches; silt loam
AC—4 to 8 inches; silt loam
C1—8 to 18 inches; silt loam
C2—18 to 40 inches; silt loam
C3—40 to 60 inches; silt loam

Steinauer

Landform: Hillslopes on uplands
Hillslope position: Backslopes
Parent material: Calcareous loamy till
Slope: 17 to 60 percent
Drainage class: Well drained
Slowest permeability: Moderately slow (about 0.20 inch per hour)
Available water capacity: High (about 10.8 inches)
Shrink-swell potential: Moderate (about 4.5 LEP)
Flooding hazard: None
Depth to seasonal zone of saturation: More than 6 feet
Surface runoff class: Very high
Ecological site: Limy Upland; Veg. Zone 4
Land capability (nonirrigated): 7e

Typical profile:
Ap—0 to 6 inches; clay loam
AC—6 to 15 inches; clay loam
C1—15 to 41 inches; clay loam
C2—41 to 60 inches; clay loam

Similar soils: Soils that have a surface layer more than 10 inches thick

Minor components

Judson
Extent: About 10 percent of the unit
Landform: Hillslopes on uplands
Slope: 2 to 5 percent
Drainage class: Well drained
Ecological site: Silty; Veg. Zone 4

General Considerations

- All of the acreage of this unit is used as rangeland or wildlife habitat.
- Trees and other shrubs are a problem unless proper management is applied.

3890—Inglewood loamy fine sand, rarely flooded

Map Unit Composition

Inglewood: 85 percent
Minor components: 15 percent

Component Descriptions

Inglewood

Landform: Flood plains in river valleys
Parent material: Sandy alluvium
Slope: 0 to 3 percent
Drainage class: Moderately well drained
Slowest permeability: Rapid (about 5.95 inches per hour)
Available water capacity: Moderate (about 7.0 inches)
Shrink-swell potential: Low (about 1.5 LEP)
Flooding frequency: Rare
Depth to seasonal zone of saturation: About 36 to 72 inches
Surface runoff class: Low
Ecological site: Sandy Lowland; Veg. Zone 4
Land capability (irrigated): 3e
Land capability (nonirrigated): 4e

Typical profile:
Ap—0 to 5 inches; loamy fine sand
C1—5 to 22 inches; stratified sand to fine sandy loam
C2—22 to 30 inches; stratified sand to fine sandy loam
C3—30 to 40 inches; stratified sand to fine sandy loam
C4—40 to 50 inches; sand, fine sand
Cg—50 to 80 inches; sand, fine sand

Minor components

Boel
Phase: Occasionally flooded
Extent: About 8 percent of the unit
Slope: 0 to 3 percent
Drainage class: Somewhat poorly drained
Ecological site: Subirrigated; Veg. Zone 4

Wann
Phase: Occasionally flooded
Extent: About 5 percent of the unit
Slope: 0 to 2 percent
Drainage class: Somewhat poorly drained
Ecological site: Subirrigated; Veg. Zone 4

Barney
Phase: Frequently flooded
Extent: About 2 percent of the unit
Slope: 0 to 2 percent
Drainage class: Poorly drained
Ecological site: Wetland; Veg. Zone 3

General Considerations

- Most of the acreage of this unit is used for pasture or mowed for hay. A small acreage is used for cultivated crops. Most areas that were cultivated have been reseeded to grass.
- The hazard of soil blowing is severe.
- If this unit is irrigated, sprinkler irrigation is best suited because frequent and light applications of irrigation water are needed. Excess water leaches plant nutrients and pesticides below the plant roots.

4104—Judson silt loam, 0 to 2 percent slopes

Map Unit Composition

Judson: 85 percent
Minor components: 15 percent

Component Descriptions

Judson

Landform: Hillslopes on uplands
Hillslope position: Footslopes
Parent material: Fine-silty colluvium
Slope: 0 to 2 percent
Drainage class: Well drained
Slowest permeability: Moderate (about 0.60 inch per hour)
Available water capacity: Very high (about 13.0 inches)
Shrink-swell potential: Moderate (about 4.5 LEP)
Flooding hazard: None
Depth to seasonal zone of saturation: More than 6 feet
Surface runoff class: Low
Ecological site: Silty; Veg. Zone 4
Land capability (irrigated): 1
Land capability (nonirrigated): 1

Typical profile:
Ap1—0 to 6 inches; silt loam
Ap2—6 to 12 inches; silty clay loam
A1—12 to 22 inches; silty clay loam
A2—22 to 31 inches; silty clay loam
AB—31 to 43 inches; silty clay loam
Bw1—43 to 54 inches; silty clay loam
Bw2—54 to 69 inches; silty clay loam
Bw3—69 to 80 inches; silty clay loam

Similar soils: Soils that contain more clay in the particle-size control section; soils that have a surface layer of loam; soils that have a dark surface layer less than 24 inches thick

Minor components

Kenridge
Phase: Occasionally flooded
Extent: About 15 percent of the unit
Slope: 0 to 2 percent
Drainage class: Moderately well drained
Ecological site: Silty Lowland; Veg. Zone 4

General Considerations

- Most of the acreage of this unit is used for cultivated crops.

4106—Judson silt loam, 2 to 5 percent slopes

Map Unit Composition

Judson: 90 percent
Minor components: 10 percent

Component Descriptions

Judson

Landform: Hillslopes on uplands
Hillslope position: Footslopes
Parent material: Fine-silty colluvium
Slope: 2 to 5 percent
Drainage class: Well drained
Slowest permeability: Moderate (about 0.60 inch per hour)
Available water capacity: Very high (about 13.0 inches)
Shrink-swell potential: Moderate (about 4.5 LEP)
Flooding hazard: None
Depth to seasonal zone of saturation: More than 6 feet
Surface runoff class: Low
Ecological site: Silty; Veg. Zone 4
Land capability (irrigated): 3e
Land capability (nonirrigated): 2e

Typical profile:
Ap1—0 to 6 inches; silt loam
Ap2—6 to 12 inches; silty clay loam

A1—12 to 22 inches; silty clay loam
A2—22 to 31 inches; silty clay loam
AB—31 to 43 inches; silty clay loam
Bw1—43 to 54 inches; silty clay loam
Bw2—54 to 69 inches; silty clay loam
Bw3—69 to 80 inches; silty clay loam

Similar soils: Soils that contain more clay in the particle-size control section; soils that have a surface layer of loam; soils that have a dark surface layer less than 24 inches thick

Minor components

Nodaway
Phase: Occasionally flooded
Extent: About 10 percent of the unit
Slope: 0 to 2 percent
Drainage class: Moderately well drained
Ecological site: Silty Overflow; Veg. Zone 4

General Considerations

- Areas of this map unit are typically long and narrow.
- Most of the acreage is used for cultivated crops. Corn, soybeans, and grain sorghum are the principal crops.

4250—Kenridge silty clay loam, occasionally flooded

Map Unit Composition

Kenridge: 92 percent
Minor components: 8 percent

Component Descriptions

Kenridge

Landform: Flood plains in river valleys
Parent material: Silty alluvium
Slope: 0 to 2 percent
Drainage class: Moderately well drained
Slowest permeability: Moderately slow (about 0.20 inch per hour)
Available water capacity: High (about 11.8 inches)
Shrink-swell potential: Moderate (about 4.5 LEP)
Flooding frequency: Occasional
Depth to seasonal zone of saturation: About 36 to 72 inches
Surface runoff class: Low
Ecological site: Silty Lowland; Veg. Zone 4
Land capability (irrigated): 2w
Land capability (nonirrigated): 2w

Typical profile:
Ap—0 to 8 inches; silty clay loam
A—8 to 20 inches; silty clay loam
Bw1—20 to 36 inches; silty clay loam
Bw2—36 to 46 inches; silty clay loam
Bw3—46 to 60 inches; silty clay loam
BC—60 to 80 inches; silty clay loam

Minor components

Muscotah
Phase: Occasionally flooded
Extent: About 6 percent of the unit
Slope: 0 to 1 percent
Drainage class: Somewhat poorly drained
Ecological site: Clayey Overflow; Veg. Zone 4

Obert
Phase: Occasionally flooded
Extent: About 2 percent of the unit
Slope: 0 to 2 percent
Drainage class: Poorly drained
Ecological site: Wetland; Veg. Zone 4

General Considerations

- Most of the acreage of this unit is used for cultivated crops. Some of the acreage is used for pasture or mowed for hay.
- Some areas are irrigated if water is available.

4404—Lamo silty clay loam, occasionally flooded

Map Unit Composition

Lamo: 96 percent
Minor components: 4 percent

Component Descriptions

Lamo

Landform: Flood plains in river valleys
Parent material: Silty alluvium
Slope: 0 to 2 percent
Drainage class: Somewhat poorly drained
Slowest permeability: Moderately slow (about 0.20 inch per hour)
Available water capacity: Very high (about 12.2 inches)
Shrink-swell potential: Moderate (about 4.5 LEP)
Flooding frequency: Occasional
Depth to seasonal zone of saturation: About 12 to 36 inches
Surface runoff class: Low

Ecological site: Subirrigated; Veg. Zone 4
Land capability (irrigated): 2w
Land capability (nonirrigated): 2w

Typical profile:
Ap—0 to 5 inches; silty clay loam
A—5 to 25 inches; silty clay loam
AC—25 to 36 inches; silty clay loam
C1—36 to 44 inches; silty clay loam
C2—44 to 60 inches; silty clay loam

Minor components

Obert
Phase: Occasionally flooded
Extent: About 4 percent of the unit
Slope: 0 to 2 percent
Drainage class: Poorly drained
Ecological site: Wetland; Veg. Zone 4

General Considerations

• Most of the acreage of this unit is used for cultivated crops. Some of the acreage is used for pasture or mowed for hay.
• Some areas of this unit are irrigated if water is available.

4583—Lex loam, occasionally flooded

Map Unit Composition

Lex: 94 percent
Minor components: 6 percent

Component Descriptions

Lex

Landform: Flood plains in river valleys
Parent material: Loamy alluvium over sandy and gravelly alluvium
Slope: 0 to 2 percent
Drainage class: Somewhat poorly drained
Slowest permeability: Moderately slow (about 0.20 inch per hour)
Available water capacity: Moderate (about 6.8 inches)
Shrink-swell potential: Low (about 1.5 LEP)
Flooding frequency: Occasional
Depth to seasonal zone of saturation: About 12 to 36 inches
Surface runoff class: Low
Ecological site: Subirrigated; Veg. Zone 4
Land capability (irrigated): 3w
Land capability (nonirrigated): 3w

Typical profile:
Ap—0 to 7 inches; loam
A1—7 to 17 inches; clay loam
A2—17 to 19 inches; loam
C1—19 to 27 inches; stratified fine sandy loam to loam to sandy clay loam
2C2—27 to 60 inches; coarse sand

Minor components

Wann
Phase: Occasionally flooded
Extent: About 4 percent of the unit
Slope: 0 to 2 percent
Drainage class: Somewhat poorly drained
Ecological site: Subirrigated; Veg. Zone 4

Barney
Phase: Frequently flooded
Extent: About 2 percent of the unit
Slope: 0 to 2 percent
Drainage class: Poorly drained
Ecological site: Wetland; Veg. Zone 3

General Considerations

• Most of the acreage of this unit is used for cultivated crops. Some of the acreage is used for pasture or mowed for hay.
• Some areas are irrigated if water is available.

4853—Malcolm silt loam, 5 to 11 percent slopes, moderately eroded

Map Unit Composition

Malcolm: 85 percent
Minor components: 15 percent

Component Descriptions

Malcolm

Landform: Hillslopes on uplands
Hillslope position: Backslopes
Parent material: Silty glaciofluvial deposits
Slope: 5 to 11 percent
Drainage class: Well drained
Slowest permeability: Moderate (about 0.60 inch per hour)
Available water capacity: Very high (about 12.0 inches)
Shrink-swell potential: Moderate (about 4.5 LEP)
Flooding hazard: None
Depth to seasonal zone of saturation: More than 6 feet
Surface runoff class: High
Ecological site: Silty; Veg. Zone 4

Land capability (irrigated): 4e
Land capability (nonirrigated): 4e

Typical profile:
A—0 to 7 inches; silt loam
Bt1—7 to 12 inches; silty clay loam
Bt2—12 to 20 inches; silty clay loam
BC—20 to 28 inches; silty clay loam
C—28 to 60 inches; silt loam

Minor components

Burchard
Extent: About 8 percent of the unit
Landform: Hillslopes on uplands
Slope: 6 to 12 percent
Drainage class: Well drained
Ecological site: Silty; Veg. Zone 4

Yutan
Extent: About 7 percent of the unit
Landform: Hillslopes on uplands
Slope: 5 to 11 percent
Drainage class: Well drained
Ecological site: Silty; Veg. Zone 4

General Considerations

• Most of the acreage of this unit is used for cultivated crops.
• The hazard of water erosion is severe. It can be controlled by contour farming, terraces, and conservation tillage.

4860—Malmo clay loam, 6 to 12 percent slopes, eroded

Map Unit Composition

Malmo: 85 percent
Minor components: 15 percent

Component Descriptions

Malmo

Landform: Hillslopes on uplands
Hillslope position: Backslopes
Parent material: Weathered till
Slope: 6 to 12 percent
Drainage class: Moderately well drained
Slowest permeability: Very slow (about 0.01 inch per hour)
Available water capacity: Moderate (about 8.1 inches)
Shrink-swell potential: High (about 7.5 LEP)
Flooding hazard: None
Depth to seasonal zone of saturation: About 12 to 36 inches
Surface runoff class: Very high
Ecological site: Clayey; Veg. Zone 4
Land capability (nonirrigated): 4e

Typical profile:
Ap—0 to 6 inches; clay loam
Bt1—6 to 15 inches; clay
Bt2—15 to 25 inches; clay
Bt3—25 to 39 inches; clay
Bt4—39 to 43 inches; gravelly clay
BC—43 to 54 inches; clay loam
C—54 to 80 inches; loam

Similar soils: Soils that have carbonates at shallower depths; soils that have 6 to 18 inches of loess on the surface; soils that have a dark surface layer more than 10 inches thick; soils that were previously mapped as Mayberry, severely eroded

Minor components

Morrill
Extent: About 9 percent of the unit
Landform: Hillslopes on uplands
Slope: 6 to 12 percent
Drainage class: Well drained
Ecological site: Silty; Veg. Zone 4

Pawnee
Extent: About 6 percent of the unit
Landform: Hillslopes on uplands
Slope: 6 to 12 percent
Drainage class: Moderately well drained
Ecological site: Clayey; Veg. Zone 4

General Considerations

• Most of the acreage of this unit is used for cultivated crops.
• The hazard of water erosion is severe. It can be controlled by contour farming, terraces, and conservation tillage.

5388—Morrill clay loam, 6 to 12 percent slopes, moderately eroded

Map Unit Composition

Morrill: 89 percent
Minor components: 11 percent

Component Descriptions

Morrill

Landform: Hillslopes on uplands
Hillslope position: Backslopes

Parent material: Loamy till or outwash
Slope: 6 to 12 percent
Percent of surface covered by rock fragments: About 0 to 2 percent (coarse rounded gravel)
Drainage class: Well drained
Slowest permeability: Moderately slow (about 0.20 inch per hour)
Available water capacity: High (about 9.5 inches)
Shrink-swell potential: Moderate (about 4.5 LEP)
Flooding hazard: None
Depth to seasonal zone of saturation: More than 6 feet
Surface runoff class: Medium
Ecological site: Silty; Veg. Zone 4
Land capability (nonirrigated): 4e

Typical profile:
Ap—0 to 6 inches; loam
BA—6 to 12 inches; loam
Bt1—12 to 22 inches; loam
Bt2—22 to 30 inches; sandy clay loam
Bt3—30 to 35 inches; sandy clay loam
Bt4—35 to 43 inches; sandy clay loam
BC—43 to 52 inches; fine sandy loam
2C1—52 to 59 inches; fine sandy loam
2C2—59 to 73 inches; loamy fine sand
2C3—73 to 80 inches; sand

Similar soils: Soils that have a thinner surface layer; soils that have various textures below a depth of 40 inches

Minor components

Malmo
Phase: Severely eroded
Extent: About 7 percent of the unit
Landform: Hillslopes on uplands
Slope: 6 to 12 percent
Drainage class: Moderately well drained
Ecological site: Clayey; Veg. Zone 4

Steinauer
Extent: About 4 percent of the unit
Landform: Hillslopes on uplands
Slope: 6 to 12 percent
Drainage class: Well drained
Ecological site: Limy Upland; Veg. Zone 4

General Considerations

• Most of the acreage of this unit is used for cultivated crops.
• The hazard of water erosion is severe. It can be controlled by contour farming, terraces, and conservation tillage.

5480—Muscotah silty clay loam, occasionally flooded

Map Unit Composition

Muscotah: 90 percent
Minor components: 10 percent

Component Descriptions

Muscotah

Landform: Flood plains in river valleys
Parent material: Clayey alluvium
Slope: 0 to 1 percent
Drainage class: Somewhat poorly drained
Slowest permeability: Very slow (about 0.01 inch per hour)
Available water capacity: High (about 10.8 inches)
Shrink-swell potential: High (about 7.5 LEP)
Flooding frequency: Occasional
Depth to seasonal zone of saturation: About 18 to 36 inches
Surface runoff class: Low
Ecological site: Clayey Overflow; Veg. Zone 4
Land capability (irrigated): 2w
Land capability (nonirrigated): 2w

Typical profile:
Ap—0 to 9 inches; silty clay loam
A1—9 to 16 inches; silty clay loam
A2—16 to 23 inches; silty clay loam
Bw1—23 to 35 inches; silty clay
Bw2—35 to 44 inches; silty clay
Bw3—44 to 60 inches; silty clay
Bw4—60 to 70 inches; silty clay
Bg—70 to 80 inches; silty clay

Similar soils: Soils that contain more clay in the particle-size control section; soils that are calcareous at the surface

Minor components

Nodaway
Phase: Occasionally flooded
Extent: About 7 percent of the unit
Slope: 0 to 1 percent
Drainage class: Moderately well drained
Ecological site: Silty Overflow; Veg. Zone 4

Kezan
Phase: Occasionally flooded
Extent: About 3 percent of the unit
Slope: 0 to 1 percent
Drainage class: Poorly drained
Ecological site: Wet Subirrigated; Veg. Zone 4

General Considerations

• In most areas of this unit, the drainage has been altered in order to reduce the hazard of wetness.
• Most of the acreage is used for cultivated crops. Corn, soybeans, and grain sorghum are the principal crops.

5540—Nodaway silt loam, occasionally flooded

Map Unit Composition

Nodaway: 90 percent
Minor components: 10 percent

Component Descriptions

Nodaway

Landform: Flood plains in river valleys
Parent material: Silty alluvium
Slope: 0 to 2 percent
Drainage class: Moderately well drained
Slowest permeability: Moderate (about 0.60 inch per hour)
Available water capacity: Very high (about 13.0 inches)
Shrink-swell potential: Moderate (about 4.5 LEP)
Flooding frequency: Occasional
Depth to seasonal zone of saturation: About 36 to 60 inches
Surface runoff class: Negligible
Ecological site: Silty Overflow; Veg. Zone 4
Land capability (irrigated): 2w
Land capability (nonirrigated): 2w

Typical profile:
Ap—0 to 7 inches; silt loam
C1—7 to 14 inches; stratified silt loam
C2—14 to 45 inches; stratified silt loam
C3—45 to 60 inches; stratified silt loam

Similar soils: Soils that have a thick, dark surface layer; soils that have a stratified, coarse textured surface layer

Minor components

Judson
Extent: About 5 percent of the unit
Landform: Hillslopes on uplands
Slope: 0 to 2 percent
Drainage class: Well drained
Ecological site: Silty; Veg. Zone 4

Nodaway
Phase: Channeled
Extent: About 3 percent of the unit
Slope: 0 to 2 percent
Drainage class: Moderately well drained
Ecological site: Silty Overflow; Veg. Zone 4

Kezan
Phase: Occasionally flooded
Extent: About 2 percent of the unit
Slope: 0 to 2 percent
Drainage class: Poorly drained
Ecological site: Wet Subirrigated; Veg. Zone 4

General Considerations

• The Nodaway soil is stratified with recent sediments resulting from flooding.
• Most of the acreage of this unit is used for cultivated crops. Corn, soybeans, and grain sorghum are the principal crops.

5541—Nodaway silt loam, channeled, frequently flooded

Map Unit Composition

Nodaway: 85 percent
Minor components: 15 percent

Component Descriptions

Nodaway

Landform: Drainageways on flood plains in river valleys
Parent material: Silty alluvium
Slope: 0 to 2 percent
Drainage class: Moderately well drained
Slowest permeability: Moderate (about 0.60 inch per hour)
Available water capacity: Very high (about 13.0 inches)
Shrink-swell potential: Moderate (about 4.5 LEP)
Flooding frequency: Frequent
Depth to seasonal zone of saturation: About 36 to 60 inches
Surface runoff class: Negligible
Ecological site: Silty Overflow; Veg. Zone 4
Land capability (nonirrigated): 6w

Typical profile:
A—0 to 7 inches; silt loam

C1—7 to 14 inches; stratified silt loam
C2—14 to 45 inches; stratified silt loam
C3—45 to 60 inches; stratified silt loam

Similar soils: Soils that have a stratified, coarse textured surface layer

Minor components

Nodaway
Phase: Occasionally flooded
Extent: About 10 percent of the unit
Slope: 0 to 2 percent
Drainage class: Moderately well drained
Ecological site: Silty Overflow; Veg. Zone 4

Judson
Extent: About 3 percent of the unit
Landform: Hillslopes on uplands
Slope: 0 to 2 percent
Drainage class: Well drained
Ecological site: Silty; Veg. Zone 4

Kezan
Phase: Occasionally flooded
Extent: About 2 percent of the unit
Slope: 0 to 2 percent
Drainage class: Poorly drained
Ecological site: Wet Subirrigated; Veg. Zone 4

General Considerations

• Most areas of this unit are dissected by a meandering stream channel. There are short, very steep or vertical slopes into the stream channel.
• Most of the acreage supports native grasses and trees.
• This area is best suited to wildlife habitat.

5736—Obert silty clay loam, wet, frequently flooded

Map Unit Composition

Obert: 80 percent
Minor components: 20 percent

Component Descriptions

Obert

Landform: Flood plains in river valleys
Parent material: Calcareous alluvium
Slope: 0 to 2 percent
Drainage class: Very poorly drained
Slowest permeability: Moderately slow (about 0.20 inch per hour)
Available water capacity: High (about 11.6 inches)
Shrink-swell potential: High (about 7.5 LEP)
Flooding frequency: Frequent
Ponding frequency: Occasional
Depth to seasonal zone of saturation: About 0 to 18 inches
Surface runoff class: Medium
Ecological site: Wetland; Veg. Zone 4
Land capability (nonirrigated): 6w

Typical profile:
A1—0 to 12 inches; silty clay loam
A2—12 to 24 inches; silty clay loam
Cg—24 to 60 inches; silty clay loam

Minor components

Lamo
Phase: Occasionally flooded
Extent: About 11 percent of the unit
Slope: 0 to 2 percent
Drainage class: Somewhat poorly drained
Ecological site: Subirrigated; Veg. Zone 4

Fluvaquents
Extent: About 9 percent of the unit
Slope: 0 to 1 percent
Drainage class: Very poorly drained

General Considerations

• All of the acreage of this unit supports native grasses and is used for pasture or mowed for hay.

5742—Obert silty clay loam, occasionally flooded

Map Unit Composition

Obert: 86 percent
Minor components: 14 percent

Component Descriptions

Obert

Landform: Flood plains in river valleys
Parent material: Calcareous alluvium
Slope: 0 to 2 percent
Drainage class: Poorly drained
Slowest permeability: Moderately slow (about 0.20 inch per hour)
Available water capacity: High (about 11.6 inches)
Shrink-swell potential: High (about 7.5 LEP)
Flooding frequency: Occasional
Depth to seasonal zone of saturation: About 0 to 18 inches
Surface runoff class: Low
Ecological site: Wetland; Veg. Zone 4
Land capability (nonirrigated): 6w

Typical profile:
A1—0 to 12 inches; silty clay loam
A2—12 to 24 inches; silty clay loam
Cg—24 to 60 inches; silty clay loam

Minor components

Lamo
Phase: Occasionally flooded
Extent: About 11 percent of the unit
Slope: 0 to 2 percent
Drainage class: Somewhat poorly drained
Ecological site: Subirrigated; Veg. Zone 4

Obert
Phase: Frequently flooded
Extent: About 3 percent of the unit
Slope: 0 to 2 percent
Drainage class: Very poorly drained
Ecological site: Wetland; Veg. Zone 4

General Considerations

• All of the acreage of this unit supports native grasses and is used for pasture or mowed for hay.

5780—Olmitz loam, 2 to 5 percent slopes

Map Unit Composition

Olmitz: 85 percent
Minor components: 15 percent

Component Descriptions

Olmitz

Landform: Hillslopes on uplands
Hillslope position: Footslopes
Parent material: Loamy colluvium
Slope: 2 to 5 percent
Drainage class: Well drained
Slowest permeability: Moderate (about 0.60 inch per hour)
Available water capacity: High (about 10.7 inches)
Shrink-swell potential: Moderate (about 4.5 LEP)
Flooding hazard: None
Depth to seasonal zone of saturation: More than 6 feet
Surface runoff class: Medium
Land capability (irrigated): 3e
Land capability (nonirrigated): 2e

Typical profile:
Ap—0 to 6 inches; loam
A1—6 to 22 inches; clay loam
A2—22 to 32 inches; clay loam
Bw1—32 to 40 inches; clay loam
Bw2—40 to 52 inches; clay loam
BC—52 to 60 inches; clay loam

Minor components

Pahuk
Extent: About 8 percent of the unit
Landform: Hillslopes on uplands
Slope: 5 to 11 percent
Drainage class: Excessively drained
Ecological site: Sandy; Veg. Zone 4

Pohocco
Extent: About 7 percent of the unit
Landform: Hillslopes on uplands
Slope: 2 to 5 percent
Drainage class: Well drained
Ecological site: Silty; Veg. Zone 4

General Considerations

• Most of the acreage of this unit is used for cultivated crops.
• The hazard of water erosion is slight. It can be controlled by contour farming, terraces, and conservation tillage.

6046—Pawnee clay loam, 6 to 12 percent slopes, moderately eroded

Map Unit Composition

Pawnee: 80 percent
Minor components: 20 percent

Component Descriptions

Pawnee

Landform: Hillslopes on uplands
Hillslope position: Backslopes
Parent material: Clayey till
Slope: 6 to 12 percent
Drainage class: Moderately well drained
Slowest permeability: Very slow (about 0.01 inch per hour)
Available water capacity: Moderate (about 7.3 inches)
Shrink-swell potential: High (about 7.5 LEP)
Flooding hazard: None
Depth to seasonal zone of saturation: About 12 to 36 inches
Surface runoff class: High
Ecological site: Clayey; Veg. Zone 4
Land capability (irrigated): 4e
Land capability (nonirrigated): 4e

Typical profile:
Ap—0 to 6 inches; clay loam
A—6 to 10 inches; clay loam
BA—10 to 14 inches; clay loam
Bt1—14 to 24 inches; clay
Bt2—24 to 32 inches; clay
Bt3—32 to 45 inches; clay
BC—45 to 53 inches; clay
C—53 to 80 inches; clay loam

Similar soils: Soils that have a thinner surface horizon; soils that contain carbonates at a shallower depth; soils that have 6 to 18 inches of loess on the surface

Minor components

Malmo
Phase: Severely eroded
Extent: About 9 percent of the unit
Landform: Hillslopes on uplands
Slope: 6 to 12 percent
Drainage class: Moderately well drained
Ecological site: Clayey; Veg. Zone 4

Burchard
Phase: 6 to 12 percent slopes
Extent: About 6 percent of the unit
Landform: Hillslopes on uplands
Slope: 6 to 12 percent
Drainage class: Well drained
Ecological site: Silty; Veg. Zone 4

Steinauer
Phase: 6 to 12 percent slopes
Extent: About 5 percent of the unit
Landform: Hillslopes on uplands
Slope: 6 to 12 percent
Drainage class: Well drained
Ecological site: Limy Upland; Veg. Zone 4

General Considerations

• Most areas of this unit have pebbles and cobblestones on the surface.
• About half of this map unit is used as cropland. The rest is used for pasture or rangeland.
• The hazard of water erosion is severe. In most years wetness is a problem in the spring.

6130—Platte fine sandy loam, occasionally flooded

Map Unit Composition

Platte: 80 percent
Minor components: 20 percent

Component Descriptions

Platte

Landform: Flood plains in river valleys
Parent material: Loamy alluvium over sandy and gravelly alluvium
Slope: 0 to 2 percent
Drainage class: Somewhat poorly drained
Slowest permeability: Moderately rapid (about 2.00 inches per hour)
Available water capacity: Low (about 4.0 inches)
Shrink-swell potential: Low (about 1.5 LEP)
Flooding frequency: Occasional
Depth to seasonal zone of saturation: About 12 to 36 inches
Surface runoff class: Low
Land capability (irrigated): 4w
Land capability (nonirrigated): 4w

Typical profile:
Ap—0 to 5 inches; fine sandy loam
A—5 to 8 inches; very fine sandy loam
C—8 to 16 inches; very fine sandy loam
2Cg—16 to 80 inches; stratified coarse sand to gravelly coarse sand to gravelly sand

Minor components

Alda
Phase: Occasionally flooded
Extent: About 10 percent of the unit
Slope: 0 to 2 percent
Drainage class: Somewhat poorly drained
Ecological site: Subirrigated; Veg. Zone 4

Barney
Phase: Frequently flooded
Extent: About 10 percent of the unit
Slope: 0 to 2 percent
Drainage class: Poorly drained
Ecological site: Wetland; Veg. Zone 3

General Considerations

• Most of the acreage of this unit is used for cultivated crops. The rest is used for pasture or mowed for hay.
• The hazard of soil blowing is severe.
• If this unit is irrigated, sprinkler irrigation is best suited because frequent and light applications of irrigation water are needed. Excess water leaches plant nutrients and pesticides below the plant roots.

6138—Platte-Barney complex, channeled, frequently flooded

Map Unit Composition

Platte: 50 percent
Barney: 46 percent
Minor components: 4 percent

Component Descriptions

Platte

Landform: Flood plains in river valleys
Parent material: Loamy alluvium over sandy and gravelly alluvium
Slope: 0 to 2 percent
Drainage class: Somewhat poorly drained
Slowest permeability: Moderately rapid (about 2.00 inches per hour)
Available water capacity: Low (about 4.0 inches)
Shrink-swell potential: Low (about 1.5 LEP)
Flooding frequency: Frequent
Depth to seasonal zone of saturation: About 12 to 36 inches
Surface runoff class: Low
Land capability (irrigated): 6w
Land capability (nonirrigated): 6w

Typical profile:
Ap—0 to 5 inches; fine sandy loam
A—5 to 8 inches; very fine sandy loam
C—8 to 16 inches; very fine sandy loam
2Cg—16 to 80 inches; stratified coarse sand to gravelly coarse sand to gravelly sand

Barney

Landform: Flood plains in river valleys
Parent material: Loamy alluvium over sandy and gravelly alluvium
Slope: 0 to 2 percent
Drainage class: Poorly drained
Slowest permeability: Moderate (about 0.60 inch per hour)
Available water capacity: Low (about 3.6 inches)
Shrink-swell potential: Low (about 1.5 LEP)
Flooding frequency: Frequent
Depth to seasonal zone of saturation: About 0 to 24 inches
Surface runoff class: Very low
Ecological site: Wetland; Veg. Zone 3
Land capability (nonirrigated): 6w

Typical profile:
A—0 to 7 inches; silty clay loam
ACg—7 to 10 inches; loam
Cg1—10 to 30 inches; fine sand
Cg2—30 to 80 inches; coarse sand

Minor components

Inglewood
Phase: Rarely flooded
Extent: About 4 percent of the unit
Slope: 0 to 3 percent
Drainage class: Moderately well drained
Ecological site: Sandy Lowland; Veg. Zone 4

General Considerations

• All of the acreage of this unit supports native grasses and is used for pasture or wildlife habitat.

6160—Pohocco silty clay loam, 5 to 11 percent slopes, eroded

Map Unit Composition

Pohocco: 80 percent
Minor components: 20 percent

Component Descriptions

Pohocco

Landform: Hillslopes on uplands
Hillslope position: Backslopes
Parent material: Loess
Slope: 5 to 11 percent
Drainage class: Well drained
Slowest permeability: Moderate (about 0.60 inch per hour)
Available water capacity: Very high (about 12.2 inches)
Shrink-swell potential: Moderate (about 4.5 LEP)
Flooding hazard: None
Depth to seasonal zone of saturation: More than 6 feet
Surface runoff class: High
Ecological site: Silty; Veg. Zone 4
Land capability (irrigated): 4e
Land capability (nonirrigated): 3e

Typical profile:
Ap—0 to 6 inches; silty clay loam
Bw—6 to 15 inches; silt loam
Bk1—15 to 20 inches; silt loam
Bk2—20 to 28 inches; silt loam
C—28 to 80 inches; silt loam

Minor components

Yutan
Extent: About 13 percent of the unit
Landform: Hillslopes on uplands

Slope: 5 to 11 percent
Drainage class: Well drained
Ecological site: Silty; Veg. Zone 4

Judson
Extent: About 7 percent of the unit
Landform: Hillslopes on uplands
Slope: 2 to 5 percent
Drainage class: Well drained
Ecological site: Silty; Veg. Zone 4

General Considerations

• Most of the acreage of this unit is used for cultivated crops.
• The hazard of water erosion is severe. It can be controlled by contour farming, terraces, and conservation tillage.

6162—Pohocco silty clay loam, 11 to 17 percent slopes, eroded

Map Unit Composition

Pohocco: 80 percent
Minor components: 20 percent

Component Descriptions

Pohocco

Landform: Hillslopes on uplands
Hillslope position: Backslopes
Parent material: Loess
Slope: 11 to 17 percent
Drainage class: Well drained
Slowest permeability: Moderate (about 0.60 inch per hour)
Available water capacity: Very high (about 12.2 inches)
Shrink-swell potential: Moderate (about 4.5 LEP)
Flooding hazard: None
Depth to seasonal zone of saturation: More than 6 feet
Surface runoff class: High
Ecological site: Silty; Veg. Zone 4
Land capability (nonirrigated): 4e

Typical profile:
Ap—0 to 6 inches; silty clay loam
Bw—6 to 15 inches; silt loam
Bk1—15 to 20 inches; silt loam
Bk2—20 to 28 inches; silt loam
C—28 to 80 inches; silt loam

Minor components

Yutan
Extent: About 14 percent of the unit
Landform: Hillslopes on uplands
Slope: 11 to 17 percent
Drainage class: Well drained
Ecological site: Silty; Veg. Zone 4

Judson
Extent: About 6 percent of the unit
Landform: Hillslopes on uplands
Slope: 5 to 11 percent
Drainage class: Well drained
Ecological site: Silty; Veg. Zone 4

General Considerations

• Most of the acreage of this unit is used for cultivated crops.
• The hazard of water erosion is severe. It can be controlled by contour farming, terraces, and conservation tillage.

6170—Pohocco-Pahuk complex, 5 to 11 percent slopes, eroded

Map Unit Composition

Pohocco: 52 percent
Pahuk: 45 percent
Minor components: 3 percent

Component Descriptions

Pohocco

Landform: Hillslopes on uplands
Hillslope position: Backslopes
Parent material: Loess
Slope: 5 to 11 percent
Drainage class: Well drained
Slowest permeability: Moderate (about 0.60 inch per hour)
Available water capacity: Very high (about 12.2 inches)
Shrink-swell potential: Moderate (about 4.5 LEP)
Flooding hazard: None
Depth to seasonal zone of saturation: More than 6 feet
Surface runoff class: High
Ecological site: Silty; Veg. Zone 4
Land capability (irrigated): 4e
Land capability (nonirrigated): 3e

Typical profile:
Ap—0 to 6 inches; silty clay loam
Bw—6 to 15 inches; silt loam
Bk1—15 to 20 inches; silt loam
Bk2—20 to 28 inches; silt loam
C—28 to 80 inches; silt loam

Pahuk

Landform: Hillslopes on uplands
Hillslope position: Backslopes

Parent material: Sandy alluvium
Slope: 5 to 11 percent
Drainage class: Excessively drained
Slowest permeability: Rapid (about 5.95 inches per hour)
Available water capacity: Low (about 4.0 inches)
Shrink-swell potential: Low (about 1.5 LEP)
Flooding hazard: None
Depth to seasonal zone of saturation: More than 6 feet
Surface runoff class: Medium
Ecological site: Sandy; Veg. Zone 4
Land capability (irrigated): 4e
Land capability (nonirrigated): 6e

Typical profile:
A—0 to 6 inches; loamy fine sand
AC—6 to 14 inches; loamy fine sand
C1—14 to 40 inches; fine sand
C2—40 to 80 inches; fine sand

Minor components

Olmitz
Extent: About 3 percent of the unit
Landform: Hillslopes on uplands
Slope: 2 to 5 percent
Drainage class: Well drained

General Considerations

• Most of the acreage of this unit is used for cultivated crops.
• The hazard of water erosion is severe. It can be controlled by contour farming, terraces, and conservation tillage.

6172—Pohocco-Pahuk complex, 11 to 17 percent slopes, eroded

Map Unit Composition

Pohocco: 59 percent
Pahuk: 35 percent
Minor components: 6 percent

Component Descriptions

Pohocco

Landform: Hillslopes on uplands
Hillslope position: Backslopes
Parent material: Loess
Slope: 11 to 17 percent
Drainage class: Well drained
Slowest permeability: Moderate (about 0.60 inch per hour)
Available water capacity: Very high (about 12.2 inches)
Shrink-swell potential: Moderate (about 4.5 LEP)
Flooding hazard: None
Depth to seasonal zone of saturation: More than 6 feet
Surface runoff class: High
Ecological site: Silty; Veg. Zone 4
Land capability (nonirrigated): 4e

Typical profile:
Ap—0 to 6 inches; silty clay loam
Bw—6 to 15 inches; silt loam
Bk1—15 to 20 inches; silt loam
Bk2—20 to 28 inches; silt loam
C—28 to 80 inches; silt loam

Pahuk

Landform: Hillslopes on uplands
Hillslope position: Backslopes
Parent material: Sandy alluvium
Slope: 11 to 17 percent
Drainage class: Excessively drained
Slowest permeability: Rapid (about 5.95 inches per hour)
Available water capacity: Low (about 4.0 inches)
Shrink-swell potential: Low (about 1.5 LEP)
Flooding hazard: None
Depth to seasonal zone of saturation: More than 6 feet
Surface runoff class: Medium
Ecological site: Sandy; Veg. Zone 4
Land capability (nonirrigated): 6e

Typical profile:
A—0 to 6 inches; loamy fine sand
AC—6 to 14 inches; loamy fine sand
C1—14 to 40 inches; fine sand
C2—40 to 80 inches; fine sand

Minor components

Olmitz
Extent: About 6 percent of the unit
Landform: Hillslopes on uplands
Slope: 2 to 5 percent
Drainage class: Well drained

General Considerations

• Most of the acreage of this unit is used for cultivated crops.
• The hazard of water erosion is severe. It can be controlled by contour farming, terraces, and conservation tillage.

6520—Saltillo silt loam, occasionally flooded

Map Unit Composition

Saltillo: 85 percent
Minor components: 15 percent

Component Descriptions

Saltillo

Landform: Flood plains in river valleys
Parent material: Silty alluvium
Slope: 0 to 2 percent
Drainage class: Poorly drained
Slowest permeability: Moderate (about 0.60 inch per hour)
Available water capacity: High (about 11.9 inches)
Shrink-swell potential: Moderate (about 4.5 LEP)
Flooding frequency: Occasional
Depth to seasonal zone of saturation: About 0 to 18 inches
Surface runoff class: Low
Ecological site: Saline Subirrigated; Veg. Zone 4
Land capability (nonirrigated): 6s

Typical profile:
An—0 to 6 inches; silt loam
Bn—6 to 17 inches; silt loam
Anb1—17 to 32 inches; stratified silt loam to silty clay loam
Anb2—32 to 50 inches; stratified silt loam to silty clay loam
Anb3—50 to 60 inches; stratified silt loam to silty clay loam
Cn—60 to 80 inches; stratified silt loam to silty clay loam

Minor components

Fluvaquents
Extent: About 9 percent of the unit
Slope: 0 to 1 percent
Drainage class: Very poorly drained

Salmo
Extent: About 6 percent of the unit
Slope: 0 to 1 percent
Drainage class: Somewhat poorly drained
Ecological site: Saline Subirrigated; Veg. Zone 4

General Considerations

• All of the acreage of this unit supports native grasses and is used for pasture or mowed for hay.

6791—Scott silt loam, terrace, frequently ponded

Map Unit Composition

Scott: 100 percent

Component Descriptions

Scott

Landform: Playas on terraces in valleys
Parent material: Loess
Slope: 0 to 1 percent
Drainage class: Very poorly drained
Slowest permeability: Very slow (about 0.01 inch per hour)
Available water capacity: High (about 9.1 inches)
Shrink-swell potential: High (about 7.5 LEP)
Flooding hazard: None
Ponding frequency: Frequent
Depth to seasonal zone of saturation: About 0 to 24 inches
Surface runoff class: Negligible
Land capability (nonirrigated): 5w

Typical profile:
A—0 to 6 inches; silt loam
E—6 to 18 inches; silt loam
Bt1—18 to 28 inches; silty clay
Bt2—28 to 42 inches; silty clay
Bt3—42 to 56 inches; silty clay
Bt4—56 to 80 inches; silty clay

General Considerations

• Most of the acreage of this unit is used for wildlife habitat.
• Some small areas of this unit have been drained and are used for cultivated crops (fig. 1).

7069—Steinauer clay loam, 12 to 30 percent slopes

Map Unit Composition

Steinauer: 85 percent
Minor components: 15 percent

Component Descriptions

Steinauer

Landform: Hillslopes on uplands
Hillslope position: Backslopes
Parent material: Calcareous loamy till
Slope: 12 to 30 percent

Drainage class: Well drained
Slowest permeability: Moderately slow (about 0.20 inch per hour)
Available water capacity: High (about 10.8 inches)
Shrink-swell potential: Moderate (about 4.5 LEP)
Flooding hazard: None
Depth to seasonal zone of saturation: More than 6 feet
Surface runoff class: Very high
Ecological site: Limy Upland; Veg. Zone 4
Land capability (nonirrigated): 6e

Typical profile:
Ap—0 to 6 inches; clay loam
AC—6 to 15 inches; clay loam
C1—15 to 41 inches; clay loam
C2—41 to 60 inches; clay loam

Similar soils: Soils that have a surface layer more than 10 inches thick

Minor components

Burchard
Extent: About 12 percent of the unit
Landform: Hillslopes on uplands
Slope: 12 to 30 percent
Drainage class: Well drained
Ecological site: Silty; Veg. Zone 4

Nodaway
Phase: Channeled
Extent: About 3 percent of the unit
Slope: 0 to 2 percent
Drainage class: Moderately well drained
Ecological site: Silty Overflow; Veg. Zone 4

General Considerations

- This map unit is typically long and narrow.
- All of the acreage of this unit is used for rangeland or pasture.

Figure 1.—Scott silt loam, terrace, 0 to 1 percent slopes, in the tall grass area. This soil provides good wildlife habitat.

• Cedar trees and other shrubs are a problem unless proper management is applied.

7290—Tomek silt loam, 0 to 2 percent slopes

Map Unit Composition

Tomek: 86 percent
Minor components: 14 percent

Component Descriptions

Tomek

Landform: Stream terraces in valleys
Parent material: Loess
Slope: 0 to 2 percent
Drainage class: Well drained
Slowest permeability: Moderately slow (about 0.20 inch per hour)
Available water capacity: High (about 11.0 inches)
Shrink-swell potential: High (about 7.5 LEP)
Flooding hazard: None
Depth to seasonal zone of saturation: More than 6 feet
Surface runoff class: Medium
Ecological site: Silty; Veg. Zone 4
Land capability (irrigated): 1
Land capability (nonirrigated): 1

Typical profile:
Ap—0 to 11 inches; silt loam
AB—11 to 19 inches; silty clay loam
Bt—19 to 54 inches; silty clay loam
B/C—54 to 80 inches; silty clay loam

Minor components

Filbert
Extent: About 11 percent of the unit
Slope: 0 to 1 percent
Drainage class: Somewhat poorly drained
Ecological site: Clayey; Veg. Zone 4

Fillmore
Extent: About 3 percent of the unit
Slope: 0 to 1 percent
Drainage class: Somewhat poorly drained
Ecological site: Clayey Overflow; Veg. Zone 4

General Considerations

• Most of the acreage of this unit is used for cultivated crops.

7920—Wann fine sandy loam, occasionally flooded

Map Unit Composition

Wann: 92 percent
Minor components: 8 percent

Component Descriptions

Wann

Landform: Flood plains in river valleys
Parent material: Calcareous loamy alluvium
Slope: 0 to 2 percent
Drainage class: Somewhat poorly drained
Slowest permeability: Moderately rapid (about 2.00 inches per hour)
Available water capacity: Moderate (about 8.3 inches)
Shrink-swell potential: Low (about 1.5 LEP)
Flooding frequency: Occasional
Depth to seasonal zone of saturation: About 18 to 42 inches
Surface runoff class: Low
Ecological site: Subirrigated; Veg. Zone 4
Land capability (irrigated): 2w
Land capability (nonirrigated): 2w

Typical profile:
Ap—0 to 6 inches; fine sandy loam
A—6 to 16 inches; fine sandy loam
C—16 to 50 inches; sandy loam
Cg—50 to 60 inches; stratified sandy loam to fine sandy loam to loamy sand to loam

Minor components

Boel
Phase: Occasionally flooded
Extent: About 5 percent of the unit
Slope: 0 to 3 percent
Drainage class: Somewhat poorly drained
Ecological site: Subirrigated; Veg. Zone 4

Barney
Phase: Frequently flooded
Extent: About 3 percent of the unit
Slope: 0 to 2 percent
Drainage class: Poorly drained
Ecological site: Wetland; Veg. Zone 3

General Considerations

• Most of the acreage of this unit is used for cultivated crops. The rest is used for pasture or mowed for hay.

- The hazard of soil blowing is severe.
- If this unit is irrigated, sprinkler irrigation is best suited because frequent and light applications of irrigation water are needed. Excess water leaches plant nutrients and pesticides below the plant roots.

8120—Yutan silty clay loam, 11 to 17 percent slopes, eroded

Map Unit Composition

Yutan: 88 percent
Minor components: 12 percent

Component Descriptions

Yutan

Landform: Hillslopes on uplands
Hillslope position: Backslopes
Parent material: Loess
Slope: 11 to 17 percent
Drainage class: Well drained
Slowest permeability: Moderately slow (about 0.20 inch per hour)
Available water capacity: High (about 11.1 inches)
Shrink-swell potential: Moderate (about 4.5 LEP)
Flooding hazard: None
Depth to seasonal zone of saturation: More than 6 feet
Surface runoff class: High
Ecological site: Silty; Veg. Zone 4
Land capability (nonirrigated): 4e

Typical profile:
A—0 to 6 inches; silty clay loam
Bt1—6 to 13 inches; silty clay loam
Bt2—13 to 20 inches; silty clay loam
Bt3—20 to 27 inches; silty clay loam
Bt4—27 to 32 inches; silty clay loam
BC—32 to 43 inches; silty clay loam
C1—43 to 63 inches; silt loam
C2—63 to 80 inches; silt loam

Minor components

Judson
Extent: About 12 percent of the unit
Landform: Hillslopes on uplands
Slope: 5 to 11 percent
Drainage class: Well drained
Ecological site: Silty; Veg. Zone 4

General Considerations

- Most of the acreage of this unit is used for cultivated crops.
- The hazard of water erosion is severe. It can be controlled by contour farming, terraces, and conservation tillage.

8124—Yutan silty clay loam, terrace, 2 to 5 percent slopes, eroded

Map Unit Composition

Yutan: 92 percent
Minor components: 8 percent

Component Descriptions

Yutan

Landform: Stream terraces in valleys
Parent material: Loess
Slope: 2 to 5 percent
Drainage class: Well drained
Slowest permeability: Moderately slow (about 0.20 inch per hour)
Available water capacity: High (about 11.1 inches)
Shrink-swell potential: Moderate (about 4.5 LEP)
Flooding hazard: None
Depth to seasonal zone of saturation: More than 6 feet
Surface runoff class: High
Ecological site: Silty; Veg. Zone 4
Land capability (irrigated): 3e
Land capability (nonirrigated): 2e

Typical profile:
A—0 to 6 inches; silty clay loam
Bt1—6 to 13 inches; silty clay loam
Bt2—13 to 20 inches; silty clay loam
Bt3—20 to 27 inches; silty clay loam
Bt4—27 to 32 inches; silty clay loam
BC—32 to 43 inches; silty clay loam
C1—43 to 63 inches; silt loam
C2—63 to 80 inches; silt loam

Minor components

Tomek
Extent: About 8 percent of the unit
Slope: 0 to 2 percent
Drainage class: Well drained
Ecological site: Silty; Veg. Zone 4

General Considerations

- Most of the acreage of this unit is used for cultivated crops.
- The hazard of water erosion is moderate. It can be controlled by contour farming, terraces, and conservation tillage.

8130—Yutan, eroded-Aksarben silty clay loams, 2 to 5 percent slopes

Map Unit Composition

Yutan: 65 percent
Aksarben: 33 percent
Minor components: 2 percent

Component Descriptions

Yutan

Landform: Hillslopes on uplands
Hillslope position: Shoulders and summits
Parent material: Loess
Slope: 2 to 5 percent
Drainage class: Well drained
Slowest permeability: Moderately slow (about 0.20 inch per hour)
Available water capacity: High (about 11.1 inches)
Shrink-swell potential: Moderate (about 4.5 LEP)
Flooding hazard: None
Depth to seasonal zone of saturation: More than 6 feet
Surface runoff class: High
Ecological site: Silty; Veg. Zone 4
Land capability (irrigated): 3e
Land capability (nonirrigated): 2e

Typical profile:
A—0 to 6 inches; silty clay loam
Bt1—6 to 13 inches; silty clay loam
Bt2—13 to 20 inches; silty clay loam
Bt3—20 to 27 inches; silty clay loam
Bt4—27 to 32 inches; silty clay loam
BC—32 to 43 inches; silty clay loam
C1—43 to 63 inches; silt loam
C2—63 to 80 inches; silt loam

Aksarben

Landform: Hillslopes on uplands
Hillslope position: Summits
Parent material: Loess
Slope: 2 to 5 percent
Drainage class: Well drained
Slowest permeability: Moderately slow (about 0.20 inch per hour)
Available water capacity: High (about 10.7 inches)
Shrink-swell potential: Moderate (about 4.5 LEP)
Flooding hazard: None
Depth to seasonal zone of saturation: More than 6 feet
Surface runoff class: Low
Ecological site: Silty; Veg. Zone 4
Land capability (irrigated): 3e
Land capability (nonirrigated): 2e

Typical profile:
Ap—0 to 6 inches; silty clay loam
A—6 to 12 inches; silty clay loam
Bt1—12 to 18 inches; silty clay loam
Bt2—18 to 26 inches; silty clay loam
Bt3—26 to 34 inches; silty clay loam
Bt4—34 to 42 inches; silty clay loam
BC—42 to 60 inches; silty clay loam
C—60 to 80 inches; silt loam

Similar soils: Soils that are dark to a depth of more than 24 inches

Minor components

Judson
Extent: About 2 percent of the unit
Landform: Hillslopes on uplands
Slope: 2 to 5 percent
Drainage class: Well drained
Ecological site: Silty; Veg. Zone 4

General Considerations

• Most of the acreage of this unit is used for cultivated crops.
• The hazard of water erosion is moderate. It can be controlled by contour farming, terraces, and conservation tillage.

8134—Yutan, eroded-Judson complex, 5 to 11 percent slopes

Map Unit Composition

Yutan: 64 percent
Judson: 25 percent
Minor components: 11 percent

Component Descriptions

Yutan

Landform: Hillslopes on uplands
Hillslope position: Backslopes
Parent material: Loess
Slope: 5 to 11 percent
Drainage class: Well drained
Slowest permeability: Moderately slow (about 0.20 inch per hour)
Available water capacity: High (about 11.1 inches)
Shrink-swell potential: Moderate (about 4.5 LEP)
Flooding hazard: None
Depth to seasonal zone of saturation: More than 6 feet
Surface runoff class: High
Ecological site: Silty; Veg. Zone 4
Land capability (irrigated): 4e
Land capability (nonirrigated): 3e

Typical profile:
A—0 to 6 inches; silty clay loam
Bt1—6 to 13 inches; silty clay loam
Bt2—13 to 20 inches; silty clay loam
Bt3—20 to 27 inches; silty clay loam
Bt4—27 to 32 inches; silty clay loam
BC—32 to 43 inches; silty clay loam
C1—43 to 63 inches; silt loam
C2—63 to 80 inches; silt loam

Judson

Landform: Hillslopes on uplands
Hillslope position: Footslopes
Parent material: Fine-silty colluvium
Slope: 5 to 11 percent
Drainage class: Well drained
Slowest permeability: Moderate (about 0.60 inch per hour)
Available water capacity: Very high (about 13.0 inches)
Shrink-swell potential: Moderate (about 4.5 LEP)
Flooding hazard: None
Depth to seasonal zone of saturation: More than 6 feet
Surface runoff class: Low
Ecological site: Silty; Veg. Zone 4
Land capability (irrigated): 4e
Land capability (nonirrigated): 3e

Typical profile:
Ap1—0 to 6 inches; silt loam
Ap2—6 to 12 inches; silty clay loam
A1—12 to 22 inches; silty clay loam
A2—22 to 31 inches; silty clay loam
AB—31 to 43 inches; silty clay loam
Bw1—43 to 54 inches; silty clay loam
Bw2—54 to 69 inches; silty clay loam
Bw3—69 to 80 inches; silty clay loam

Similar soils: Soils that contain more clay in the particle-size control section; soils that have a surface layer of loam; soils that have a dark surface layer less than 24 inches thick

Minor components

Aksarben
Extent: About 11 percent of the area
Landform: Interfluves on uplands
Slope: 2 to 5 percent
Drainage class: Well drained
Ecological site: Silty; Veg. Zone 4

General Considerations

• Most of this unit is used for cultivated crops.
• The hazard of water erosion is severe. It can be controlled by contour farming, terraces, and conservation tillage (fig. 2).

9900—Arents, earthen dam

Map Unit Composition

Arents, earthen dam: 100 percent

Component Descriptions

Arents, earthen dam

Depth to seasonal zone of saturation: More than 6 feet
Land capability (nonirrigated): 8

General Considerations

• This map unit consists of barriers constructed to control the flow or raise the level of water. The dams are typically constructed with earthen material. They may be covered with earthy material or armored with concrete or rock.

9985—Gravel pits

Map Unit Composition

Pits: 100 percent

Component Descriptions

Pits

Slope: 0 to 30 percent
Drainage class: Excessively drained
Slowest permeability: Rapid (about 6.00 inches per hour)
Available water capacity: Low (about 3.5 inches)
Shrink-swell potential: Low (about 1.5 LEP)
Flooding hazard: None
Depth to seasonal zone of saturation: More than 6 feet
Land capability (nonirrigated): 8s

General Considerations

• This map unit consists of open excavations from which soil and, commonly, underlying material have been removed. Rock or other material is exposed in the excavations.

Figure 2.—Terraces, a grassed waterway, and crop residue management help to control water erosion in this area of Yutan, eroded-Judson complex, 5 to 11 percent slopes.

9998—Water

General Considerations

- This map unit includes streams, lakes, ponds, and estuaries. These areas are covered with water in most years, at least during the period that is warm enough for plants to grow. Many areas are covered with water throughout the year.

Prime Farmland

Prime farmland is one of several kinds of important farmland defined by the U.S. Department of Agriculture. It is of major importance in meeting the Nation's short- and long-range needs for food and fiber. Because the supply of high-quality farmland is limited, the U.S. Department of Agriculture recognizes that responsible levels of government, as well as individuals, should encourage and facilitate the wise use of our Nation's prime farmland.

Prime farmland, as defined by the U.S. Department of Agriculture, is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is available for these uses. It could be cultivated land, pastureland, forestland, or other land, but it is not urban or built-up land or water areas. The soil qualities, growing season, and moisture supply are those needed for the soil to economically produce sustained high yields of crops when proper management, including water management, and acceptable farming methods are applied. In general, prime farmland has an adequate and dependable supply of moisture from precipitation or irrigation, a favorable temperature and growing season, acceptable acidity or alkalinity, an acceptable salt and sodium content, and few or no rocks. It is permeable to water and air. It is not excessively erodible or saturated with water for long periods, and it either is not frequently flooded during the growing season or is protected from flooding. Slope ranges mainly from 0 to 6 percent. More detailed information about the criteria for prime farmland is available at the local office of the Natural Resources Conservation Service.

A recent trend in land use in some parts of the survey area has been the loss of some prime farmland to industrial and urban uses. The loss of prime farmland to other uses puts pressure on marginal lands, which generally are more erodible, droughty, and less productive and cannot be easily cultivated.

The map units in the survey area that are considered prime farmland are listed in table 5. This list does not constitute a recommendation for a particular land use. On some soils included in the list, measures that overcome a hazard or limitation, such as flooding, wetness, and droughtiness, are needed. Onsite evaluation is needed to determine whether or not the hazard or limitation has been overcome by corrective measures. The extent of each listed map unit is shown in table 4. The location is shown on the detailed soil maps. The soil qualities that affect use and management are described under the heading "Detailed Soil Map Units."

Use and Management of the Soils

This soil survey is an inventory and evaluation of the soils in the survey area. It can be used to adjust land uses to the limitations and potentials of natural resources and the environment. Also, it can help to prevent soil-related failures in land uses.

In preparing a soil survey, soil scientists, conservationists, engineers, and others collect extensive field data about the nature and behavioral characteristics of the soils. They collect data on erosion, droughtiness, flooding, and other factors that affect various soil uses and management. Field experience and collected data on soil properties and performance are used as a basis in predicting soil behavior.

Information in this section can be used to plan the use and management of soils for crops and pasture; as rangeland and forestland; as sites for buildings, sanitary facilities, highways and other transportation systems, and parks and other recreational facilities; for agricultural waste management; and as wildlife habitat. It can be used to identify the potentials and limitations of each soil for specific land uses and to help prevent construction failures caused by unfavorable soil properties.

Planners and others using soil survey information can evaluate the effect of specific land uses on productivity and on the environment in all or part of the survey area. The survey can help planners to maintain or create a land use pattern in harmony with the natural soil.

Contractors can use this survey to locate sources of sand and gravel, roadfill, and topsoil. They can use it to identify areas where bedrock, wetness, or very firm soil layers can cause difficulty in excavation.

Health officials, highway officials, engineers, and others may also find this survey useful. The survey can help them plan the safe disposal of wastes and locate sites for pavements, sidewalks, campgrounds, playgrounds, lawns, and trees and shrubs.

Interpretive Ratings

The interpretive tables in this survey rate the soils in the survey area for various uses. Many of the tables identify the limitations that affect specified uses and indicate the severity of those limitations. The ratings in these tables are both verbal and numerical.

Rating Class Terms

Rating classes are expressed in the tables in terms that indicate the extent to which the soils are limited by all of the soil features that affect a specified use or in terms that indicate the suitability of the soils for the use. Thus, the tables may show limitation classes or suitability classes. Terms for the limitation classes are *not limited, somewhat limited,* and *very limited.* The suitability ratings are expressed as *well suited, moderately suited, poorly suited,* and *unsuited* or as *good, fair, poor,* and *very poor.*

Numerical Ratings

Numerical ratings in the tables indicate the relative severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.00 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use and the point at which the soil feature is not a limitation. The limitations appear in order from the most limiting to the least limiting. Thus, if more than one limitation is identified, the most severe limitation is listed first and the least severe one is listed last.

Crops and Pasture

General management needed for crops and pasture is suggested in this section. The system of land capability classification used by the Natural Resources Conservation Service is explained and the estimated yields of the main crops and pasture plants are listed.

Planners of management systems for individual fields or farms should consider the detailed information given in the description of each soil under the heading "Detailed Soil Map Units." Specific information can be obtained from the local office of the Natural Resources Conservation Service or the Cooperative Extension Service.

Most of the farmland in Saunders County is cultivated. About 85 percent of the county is used for cropland and 7 percent is used for pasture or rangeland. About 2 percent is forestland. The largest

acreage is used for planting corn, followed by soybeans, wheat, grain sorghum, and alfalfa. About 13 percent of the cropland is irrigated.

The soils of Saunders County are well suited to cultivated crops if proper management is applied. The Yutan, Aksarben, Pohocco, and Tomek soils make up the majority of the acreage used for cropland in the county.

Management for Dryland Crops

Good management practices for dryland crops are those that reduce the runoff rate, help to control the hazards of water erosion and soil blowing, conserve moisture, and improve tilth. Most of the soils in Saunders County are suitable for the production of crops. In many places, however, the severe hazard of erosion needs to be reduced or corrected by suitable conservation practices.

The hazard of water erosion is a major problem on about 75 percent of the acreage that has potential for use as cropland. Loss of the surface layer through erosion is damaging for two reasons. First, productivity is reduced when the surface layer is lost and part of the subsoil is incorporated into the plow layer. Second, the sediment produced from erosion is a pollutant to streams. Loss of the surface layer is especially damaging to soils that have a clayey subsoil, for example, Pawnee and Malmo soils. Control of erosion minimizes sediment pollution of streams and improves the quality of water for fish and wildlife and for municipal and recreational uses.

The overall hazard of erosion can be reduced if the more productive soils are used for row crops and steeper, more erosive soils are used for such close growing crops as wheat, rye, alfalfa, or hay and pasture. Proper use can reduce the hazard of erosion in many areas. Under dryland management, the kind and the amount of fertilizer to be applied should be based on results of the soil tests and on the content of moisture in the soil at the time of application. If the subsoil is dry and rainfall is low, the rate at which fertilizer is applied should be slightly lower than the rate applied if subsoil moisture is adequate. For nonlegume crops, the application of nitrogen fertilizer is beneficial in all soils. Application of phosphorus and zinc are needed on the more eroded soils or on areas that were excavated for construction of terraces or waterways. Erosion control practices provide protective surface cover, reduce runoff, and increase infiltration. A cropping sequence that keeps vegetative cover on the soil for extended periods can reduce soil erosion so that the productive capacity of the soil is not decreased.

In intensive cropping systems, crop residue is an important asset to water conservation, soil fertility, and erosion control. Standing crop stubble can be used to trap snow on the field and to limit water loss by evaporation. If crop residue is returned to the soil, it helps to maintain soil fertility and improve soil tilth for future crops. Two tons of crop residue per acre contain about 20 pounds of nitrogen, 10 pounds of available phosphate, and about 30 pounds of potash. Soil bulk density is reduced by returning crop stubble to the soil, and soil crusting problems and fuel requirements for tillage are reduced by less soil density. More importantly, crop residue left on the surface helps to control erosion.

The sequence of crops grown on a field, in combination with the practices needed for management and conservation of the soil, is known as a Resource Management System. On livestock farms, the Resource Management System includes grasses and legumes in the crop rotation and the use of manure for improvement of soil fertility. These practices reduce water and wind erosion on land that has short and irregular slopes in areas where contouring and terracing are not feasible. In addition, they supply plant nutrients and improve soil tilth. The practice of conservation tillage that leaves crop residue on the surface reduces the hazards of water and wind erosion. At least 1,500 pounds of row crop residue should be left on the surface in order to significantly reduce erosion.

On cropland, the Resource Management System should preserve tilth and fertility; maintain a plant cover that protects the soil from erosion; control weeds, insects, and diseases; and reduce runoff. Cropland Resource Management Systems vary according to the soils on which they are used. For example, a Resource Management System for cropland on Malmo clay loam, 6 o 12 percent slopes, eroded, should include a high percentage of grass and legume crops in the crop rotation, terraces, contour farming, and a conservation tillage system that leaves 2,000 pounds of crop residue on the surface after planting. In contrast, on Kenridge silty clay loam, occasionally flooded, row crops can be continuously grown. If crop residue is left on the field through winter, applications of fertilizer and good management are sufficient to maintain the productive capacity of the Kenridge soil.

No-tillage or till-plant, when used for row crop production, will effectively reduce erosion on sloping land (fig. 3). These tillage practices can be adapted to most soils in the survey area. Terraces and diversions reduce the length of slope and reduce runoff and

Figure 3.—No-till soybeans have been planted into corn stubble in this area of Pohocco silty clay loam, 5 to 11 percent slopes, eroded. This practice can reduce the hazard of water erosion.

erosion. These practices are most effective on deep, well drained soils that have regular slopes. Yutan and Pohocco soils are suitable for terraces and contour farming. Contour farming also improves the effectiveness of conservation tillage systems. Terraces, contour farming, grassed waterways, contour stripcropping, and conservation tillage systems are erosion control practices that can be used in Saunders County. The hazard of wind erosion in Saunders County is minor, but management practices similar to those that control water erosion can be used to control the hazard of wind erosion. Stubble mulching, conservation tillage, crop residue management, wind stripcropping, and narrow field windbreaks help to control the hazard of wind erosion.

Management for Irrigated Crops

The ground water supply is limited on the uplands in Saunders County. The area known as the Todd Valley and the flood plain areas along the Platte River have a better ground water supply. Sprinkler irrigation is the dominant method used in areas where water is available. Corn is the primary irrigated crop. Gently sloping soils, for example, Yutan silty clay loam, terrace, 2 to 5 percent slopes, eroded, are subject to the hazard of water erosion if they are irrigated, and to the hazard of wind erosion if they are fall plowed (fig. 4). Conservation practices similar to those that control water erosion on dryland cropland apply to irrigated acreages. Terraces, contour farming, use of crop residue, and conservation tillage systems that leave a protective cover or crop residue on the surface after row crop plantings increase water intake of the soil, slow runoff, and reduce erosion. In addition, they improve the soil tilth.

Sprinkler irrigation can be used on the more sloping soils; however, conservation practices need to be applied to control soil erosion. Surface irrigation is suitable for nearly level soils. If surface irrigation is used, land leveling increases efficiency of the system because water is evenly distributed. The efficiency of other methods of irrigation can be improved if tailwater recovery systems are added.

Contour bench leveling or contour furrow irrigation can be used on soils that have 2 to 5 percent slopes. These practices help to conserve rainfall and irrigation water.

Maximum efficiency is obtained if irrigation is started when about one-half of the stored water has been used by the plants. For example, if a soil holds 8 inches of available water, irrigation should begin when about 4 inches of water has been removed by the crop. Irrigation sets, or systems, should be planned to replace the amount of water that has been used by the crop.

Management is needed to control or regulate the application of irrigation water so that good crop growth is obtained without wasting soil or water. Furrow irrigation, or surface irrigation, is most efficient if maximum stream size is used down each row and a tailwater recovery system catches the water for reuse. Center-pivot or sprinkler-type irrigation systems are more effective if small amounts of water are applied at frequent intervals. Irrigated soils generally produce higher yields than dryland soils. Consequently, more plant nutrients, particularly nitrogen and phosphorus, are removed from the soil when crops are harvested. Return of all crop residue to the soil and additions of barnyard manure and commercial fertilizer help to supply needed plant nutrients. If soils have been disturbed during land leveling, and particularly if the topsoil has been removed, applications of phosphorus and zinc, as well as nitrogen, are desirable. The kinds and amounts of fertilizer needed for specific crops should be determined by soil tests.

All of the soil series suitable for irrigation in Nebraska are placed in an irrigation design group. These irrigation design groups are described in the Technical Guides located at the local Natural Resources Conservation Service office in Nebraska. Arabic numbers of irrigation capability units indicate the irrigation design group to which the soil belongs. Assistance in planning and design of an irrigation system is available at the local office of the Natural Resources Conservation Service. Estimates concerning cost of equipment can be obtained from local dealers and manufacturers of irrigation equipment.

Figure 4.—Leaving crop residue on the surface reduces the hazard of water erosion and increases the rate of water intake in this area of Yutan silty clay loam, terrace, 2 to 5 percent slopes, eroded.

Management of Pasture and Hayland

Pasture or hayland should be managed for maximum forage production. Once the pasture is established, the grasses should be kept productive. A rotation grazing system that meets the needs of the plants and promotes uniform use of the forage is important for high production. Many forage plants are a good source of minerals, vitamins, proteins, and other nutrients. A well managed pasture can provide a balanced ration to livestock throughout the growing season. If pastures are irrigated, a high level of management is needed.

A mixture of grasses and legumes can be grown on many kinds of soils. With proper management, the pasture will return a fair profit. This kind of mixture is compatible with grain crops in a crop rotation. It has beneficial soil-building effects because grasses and legumes help to improve soil tilth, add to the content of organic matter, and reduce erosion. A crop rotation program is ideal as part of a conservation cropping system.

Pasture and hayland, both dryland and irrigated, require additional plant nutrients for maximum production. The kinds and amounts of fertilizer needed should be determined by soil tests.

Soil tilth is an important factor in the germination of seeds and in the infiltration of water into the soil. Soils that have good tilth are granular and porous. Conservation practices including a cropping sequence with legumes and grasses in the rotation and a conservation tillage system utilizing crop residue can improve soil tilth.

Yields per Acre

The average yields per acre that can be expected of the principal crops under a high level of management are shown in table 6. In any given year, yields may be higher or lower than those indicated in the table because of variations in rainfall and other climatic factors. The land capability classification of map units in the survey area also is shown in the table.

The yields are based mainly on the experience and records of farmers, conservationists, and extension agents. Available yield data from nearby counties and results of field trials and demonstrations also are considered.

The management needed to obtain the indicated yields of the various crops depends on the kind of soil and the crop. Management can include drainage, erosion control, and protection from flooding; the proper planting and seeding rates; suitable high-yielding crop varieties; appropriate and timely tillage; control of weeds, plant diseases, and harmful insects; favorable soil reaction and optimum levels of nitrogen, phosphorus, potassium, and trace elements for each crop; effective use of crop residue, barnyard manure, and green manure crops; and harvesting that ensures the smallest possible loss.

For yields of irrigated crops, it is assumed that the irrigation system is adapted to the soils and to the crops grown, that good-quality irrigation water is uniformly applied as needed, and that tillage is kept to a minimum.

The estimated yields reflect the productive capacity of each soil for each of the principal crops. Yields are likely to increase as new production technology is developed. The productivity of a given soil compared with that of other soils, however, is not likely to change.

Crops other than those shown in table 6 are grown in the survey area, but estimated yields are not listed because the acreage of such crops is small. The local office of the Natural Resources Conservation Service or of the Cooperative Extension Service can provide information about the management and productivity of the soils for those crops.

Land Capability Classification

Land capability classification (USDA, 1961) shows, in a general way, the suitability of soils for most kinds of field crops. Crops that require special management are excluded. The soils are grouped according to their limitations for field crops, the risk of damage if they are used for crops, and the way they respond to management. The criteria used in grouping the soils do not include major and generally expensive landforming that would change slope, depth, or other characteristics of the soils, nor do they include possible but unlikely major reclamation projects. Capability classification is not a substitute for interpretations designed to show suitability and limitations of groups of soils for rangeland, for forestland, or for engineering purposes.

In the capability system, soils are generally grouped at two levels—capability class and subclass.

Capability classes, the broadest groups, are designated by the numbers 1 through 8. The numbers indicate progressively greater limitations and narrower choices for practical use. The classes are defined as follows:

Class 1 soils have slight limitations that restrict their use.

Class 2 soils have moderate limitations that restrict the choice of plants or that require moderate conservation practices.

Class 3 soils have severe limitations that restrict the choice of plants or that require special conservation practices, or both.

Class 4 soils have very severe limitations that restrict the choice of plants or that require very careful management, or both.

Class 5 soils are subject to little or no erosion but have other limitations, impractical to remove, that restrict their use mainly to pasture, rangeland, forestland, or wildlife habitat.

Class 6 soils have severe limitations that make them generally unsuitable for cultivation and that restrict their use mainly to pasture, rangeland, forestland, or wildlife habitat.

Class 7 soils have very severe limitations that make them unsuitable for cultivation and that restrict their use mainly to grazing, forestland, or wildlife habitat.

Class 8 soils and miscellaneous areas have limitations that preclude commercial plant production and that restrict their use to recreational purposes, wildlife habitat, watershed, or esthetic purposes.

Capability subclasses are soil groups within one class. They are designated by adding a small letter, *e, w, s,* or *c,* to the class numeral, for example, 2e. The letter *e* shows that the main hazard is the risk of erosion unless close-growing plant cover is maintained; *w* shows that water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); *s* shows that the soil is limited mainly because it is shallow, droughty, or stony; and *c,* used in only some parts of the United States, shows that the chief limitation is climate that is very cold or very dry.

In class 1 there are no subclasses because the soils of this class have few limitations. Class 5 contains only the subclasses indicated by *w, s,* or *c* because the soils in class 5 are subject to little or no erosion. They have other limitations that restrict their use to pasture, rangeland, forestland, wildlife habitat, or recreation.

The acreage of soils in each capability class or subclass is shown in table 7. The capability classification of map units in this survey area is given in the section "Detailed Soil Map Units" and in the yields table.

Rangeland

Kenneth L. Hladek, range conservationist, Natural Resources Conservation Service, helped prepare this section.

Rangeland, or native grass pastures, makes up less than five percent of the agricultural land in Saunders County. The largest acreages are near the Platte River and in the southwestern portion of the county on soils that are generally too steep or too wet for cultivation. Rangeland areas are usually small pastures in the Alda, Aksarben, Burchard, Gibbon, Malmo, Wann, and Yutan soils. Larger tracts with high water tables and high salinity are found surrounding the Salt Marshes in the Kenridge, Muscotah, and Nodaway soils in the south-central part of the county.

Livestock producers typically raise small herds of cows and calves. If producers manage for the total forage resources, a rangeland program can be successful. The rangeland is grazed in the summer, with the calves being sold in the fall as feeders. In the spring and early fall, they graze on cool season grasses, principally smooth brome. In late fall and early in winter, they graze on crop residues, primarily corn stalks. During the rest of the winter, they are fed native or alfalfa hay, silage, or both hay and silage.

The original vegetation in Saunders County was a Tall Grass Prairie interspersed with woody plants along the streams. The prairie was dominated by big bluestem, switchgrass, and Indiangrass. These tall grasses furnished excellent grazing in large amounts for the native wildlife and for the early settlers' livestock. Because of heavy continuous grazing over long periods of time, much of the county's rangeland has been severely depleted and is producing less than one-half of its forage potential. Most of the small native pastures now support Kentucky bluegrass and other grasses and broadleaf weeds that produce low amounts of forage. There is also invasion of woody species on the steeper slopes and of shrubs and trees along the Platte River.

Some of the rangeland can be restored by proper management practices such as proper grazing use, planned grazing systems, and brush and weed control. In areas where the original vegetation has been destroyed, however, a reseeding program is needed to establish the area to a productive stand of native grasses. Restoration of the rangeland and reseeding to native grass would improve the yield of desirable forage plants for grazing, reduce soil erosion, and greatly enhance wildlife habitat.

The information in this section can help livestock producers and conservationists in planning the management of rangeland in the county. It includes definitions of ecological sites, an explanation of how range condition is evaluated, and descriptions of planned grazing systems and other management practices affecting the sustained forage production in Saunders County.

In areas that have similar climate and topography, differences in the kind and amount of vegetation produced on rangeland are closely related to the kind of soil. Effective management is based on the relationship between the soils and vegetation and water.

Table 8 shows, for each soil that supports rangeland vegetation, the ecological site and the

potential annual production of vegetation in favorable, normal, and unfavorable years. An explanation of the column headings in the table follows.

An *ecological site* is the product of all the environmental factors responsible for its development. It has characteristic soils that have developed over time throughout the soil development process; a characteristic hydrology, particularly infiltration and runoff, that has developed over time; and a characteristic plant community (kind and amount of vegetation). The hydrology of a site is influenced by development of the soil and plant community. The vegetation, soils, and hydrology are all interrelated. Each is influenced by the others and influences the development of the others. The plant community on an ecological site is typified by an association of species that differs from that of other ecological sites in the kind and/or proportion of species or in total production. Descriptions of ecological sites are provided in the Field Office Technical Guide, which is available in local offices of the Natural Resources Conservation Service.

Total dry-weight production is the amount of vegetation that can be expected to grow annually on well managed rangeland that is supporting the potential natural plant community. It includes all vegetation, whether or not it is palatable to grazing animals. It includes the current year's growth of leaves, twigs, and fruits of woody plants. It does not include the increase in stem diameter of trees and shrubs. It is expressed in pounds per acre of air-dry vegetation for favorable, normal, and unfavorable years. In a favorable year, the amount and distribution of precipitation and the temperatures make growing conditions substantially better than average. In a normal year, growing conditions are about average. In an unfavorable year, growing conditions are well below average, generally because of low available soil moisture. Yields are adjusted to a common percent of air-dry moisture content.

Range management requires a knowledge of the kinds of soil and of the potential natural plant community. It also requires an evaluation of the present range similarity index and rangeland trend. Range similarity index is determined by comparing the present plant community with the potential natural plant community on a particular rangeland ecological site. The more closely the existing community resembles the potential community, the higher the range similarity index. Rangeland trend is defined as the direction of change in an existing plant community relative to the potential natural plant community. Further information about the range similarity index and rangeland trend is available on the Internet in chapter 4 of the "National Range and Pasture Handbook."

The objective in range management is to control grazing so that the plants growing on a site are about the same in kind and amount as the potential natural plant community for that site. Such management generally results in the optimum production of vegetation, control of undesirable brush species, conservation of water, and control of erosion. Sometimes, however, an area with a range similarity index somewhat below the potential meets grazing needs, provides wildlife habitat, and protects soil and water resources.

Proper Grazing Use

Proper grazing use on rangeland is the removal, by weight, of one-half of the current year's growth when grazing is throughout the growing season. Grazing at this intensity will maintain sufficient cover to protect the soil and maintain or improve both the quantity and quality of the desirable vegetation. Proper grazing use is the first and most important step of successful range management. Proper grazing use can improve the vigor and reproduction of desirable plants, enhance the accumulation of litter and mulch necessary to control erosion, and increase forage production.

Proper grazing use is determined by the degree to which a key species is grazed. Factors that influence proper grazing use include the stocking rates, the distribution of livestock, and the kind and class of livestock.

Distribution of livestock.—If proper range use is to be accomplished evenly over a pasture, the proper distribution of cattle within the pasture is important. Livestock tend to spend more time grazing in areas near water, roads, or trails and in areas of gentle relief. Distant corners, steep terrain, and areas away from water are often undergrazed or not grazed at all.

Poor grazing distribution may be caused by too few watering locations or by having salt, shade, supplemental feed, and water in one location or in a poor location. Continued concentration of livestock causes severe overuse and overgrazing in localized parts of a pasture, creating areas that are subject to wind erosion. Uniform distribution is best achieved by careful placement of fences, salt, and water and by using planned grazing systems.

Fences help to distribute livestock and provide more uniform grazing of forage if they are located properly. In addition, they divide pastures for grazing systems and can be used to exclude livestock from blowouts and reseeded areas. Cross-fences should be built to follow natural land features and range site

boundaries where feasible. More importantly, they should be planned so that all pastures have similar potential stocking rates and that further subdivision could be made easily, if needed. Efficiency in forage use should be considered along with convenience in operations when determining pasture size. Generally, the smaller the pasture, the more efficient the use of the forage by livestock.

Proper location of salt and minerals is one of the easiest and most economical methods of encouraging uniform use of forage in a pasture. Salt and mineral facilities can be placed some distance away from water, since cattle do not need to drink immediately after consuming them. Moving these facilities to areas of the pasture that are undergrazed during the grazing season helps to achieve uniform grazing.

Watering facilities need to be placed properly to encourage distribution. In Saunders County, water is most often obtained from dugouts on the wetter range sites, and stockwater dams or wells are suitable in areas of the heavier textured soils. The distance between watering facilities should vary, depending on topography. For example, in rough or hilly terrain, cattle should not have to travel more than 1/2 mile to water. In more level areas, the greatest distance to water should be about a mile. If the travel distance to water is excessive, cattle tend to graze close to the water sources rather than moving out to graze the pasture uniformly.

Kind and class of livestock.—Management of rangeland is dependent on the kind and class of livestock grazed. Cattle, sheep, and horses each have different grazing habits and nutritional needs that affect the way range can best be managed for proper grazing use.

Cattle are the principal livestock raised in Saunders County, and the major range sites are well suited to providing forage for them. Grazing habits differ among types of cattle. Yearlings tend to travel more within a pasture than cow-calf pairs. Also, the yearlings graze in the steeper areas and use a pasture more uniformly than cows with calves. However, trailing along fencelines by yearlings sometimes creates erosion and results in blowouts. Cow-calf pairs generally graze more on the gentler slopes and stay closer to watering facilities than the yearlings. For these reasons, grazing distribution may be more of a problem in pastures stocked with cow-calf pairs than in pastures stocked with yearlings.

General management techniques outlined in this publication apply mainly to cattle production. If livestock other than cattle are raised, management may need to be adjusted.

Range Condition

Range condition should not be confused with range use, or the degree of utilization. Range condition is the present state of the vegetation compared to its potential, or climax, vegetation. Climax vegetation is a stable plant community that represents the highest point of plant succession. It is the most productive combination of adapted forage plants on rangeland. This state represents the highest potential in kind and amount of vegetation for a given range site. It maintains itself and changes little as long as the climate and soil remain stable and grazing is at a proper level.

The purpose of determining range condition is to provide an approximate measure of the overall health of the plant community. More importantly, range condition provides a basis for predicting the degree of improvement possible under different kinds of management. Four range condition classes are used to express the degree to which the composition of the present plant community has departed from that of the climax vegetation—excellent, good, fair, and poor.

All energy that green plants use for maintenance, growth, and reproduction is manufactured in their leaves. Excessive removal of plant leaves during the growing season drastically affects the growth of both roots and tillers during the current year. It also affects the amount of energy reserves the plant is able to store during the fall, which is the basis for the next year's grass crop. Livestock graze selectively, removing more leaves from some plants than from others. This selective grazing varies according to the season of use and the kind and class of livestock. Various plants respond to continuous heavy grazing in different ways. Some decrease in abundance, others increase in abundance, and some plants that were not in the original community may invade. Plant responses to grazing are used in a system for classifying range condition.

Decreaser species on a range site are those that are in the original plant community and that decrease in abundance if grazed closely and continuously during the growing season. *Increaser plants* are those that are in the original plant community that normally increase, up to a point, under continuous heavy grazing. These species increase as the decreaser plants cover less of the site. *Invader plants* are not part of the original plant community. They begin growing in an area after the decreasers and increasers have been weakened or eliminated.

Once the range condition is determined, it is also important to know whether it is improving or deteriorating. Determining these changes or trends in

range condition can be important when adjustments are made in grazing use and management. Important factors affecting trend are plant vigor, composition change, and reproduction of both the desirable and undesirable plant species.

The goal of an economically balanced range management system should be to maintain good or excellent range condition. The highest forage yields on a sustained basis are obtained when the range is in excellent condition and the trend is in a positive direction. Under these circumstances, erosion is kept to a minimum and the plants make optimal use of precipitation.

Deferred Grazing

Deferred grazing is the resting of grazing land for a prescribed period of time. The need for deferment is based on plant vigor, range condition, and range trend. Deferment should be for a minimum of 3 consecutive months and should coincide with the critical growth periods of the key forage plants. These periods vary, depending on the species of grasses. Maximum benefit from deferment coincides with the food-storage periods. For warm-season native grasses, this period occurs in late summer (late July to early October). In some cases, a short deferment of 3 months is all that is needed, while in other cases two growing seasons of rest may be needed before there is noticeable improvement. Generally, some grazing during the year is more beneficial than a complete year-long deferment. Deferred pastures may be grazed after a hard freeze in the fall, or they can be grazed early in the spring prior to initiation of growth of the warm-season grasses. If winter grazing is allowed, protein supplements may be needed.

Deferred grazing allows plants a rest period during critical times in their growth stages. This rest period allows the grasses to build up vigor and to produce a mulch at the soil surface, thus improving the rate of water infiltration. This mulch also helps to prevent soil loss by erosion. Deferred grazing encourages natural grass reseeding by allowing desirable species to set seed and spread vegetatively.

In areas where severe overgrazing has eliminated the native grasses, reseeding of adapted native grasses is the best method of native range restoration. Reseeding of range areas, therefore, should be done only after careful evaluation to ensure that remnants of desirable grasses are not sufficient for restoring the area by other measures, such as planned grazing systems.

Planned Grazing Systems

Planned grazing systems are effective in improving range condition, and thus they result in higher forage production and better livestock performance and reduce the hazard of erosion. In a planned grazing system, two or more pastures are alternately rested and grazed in a planned sequence over a period of years. Because the same pasture is not grazed at the same time each year, the plants are not grazed by livestock at the same stage of development every year. Periods of rest are planned for each pasture sometime during the growing season, and all livestock are removed from the pasture that is being rested. This system increases plant vigor and forage production and allows the plant community to improve, and thus it results in better range condition. Planned grazing systems permit maximum and uniform use of forage while maintaining rangeland productivity over a period of years.

Planned grazing systems improve the plant cover and result in the proper use of forage. They increase grazing efficiency, because the livestock generally use all parts of the pasture. The rest periods built into a planned grazing system improve plant vigor, vegetative reproduction, and forage quality, thus increasing forage production. Planned grazing systems also help to buffer the adverse effects of drought and other climatic changes.

To be effective, planned grazing systems must be flexible and tailored to fit the needs and goals of an individual rancher. Fences, watering facilities, range condition, trend, range sites, kinds or class of grazing animals, and economic factors are all important considerations in determining the best suited system for a particular operation. Grazing systems may be simple, such as with one herd and two pastures. They may be very intensive, involving one or more herds with a larger number of pastures grazed using the basis of rate of growth of the available forage. Grazing systems are dynamic. Over a period of time, grazing systems should be modified as plant vigor and forage production improve or management goals change.

The use of a planned grazing system can eventually increase stocking rates as grazing distribution, forage production, and plant quality improve. Planned grazing systems are also effective in controlling soil erosion. Some producers have reported a reduction in parasite and disease problems among cattle because of cleaner pastures.

Range Seeding

In some areas, range management practices alone cannot restore a satisfactory cover of native vegetation. Old cultivated fields, “go back” areas, and abandoned farmsteads may need to be restored by range seeding. Range seeding may also be required

on severely overutilized areas where the vegetation has deteriorated to the point that it will not respond to management practices.

Good stands of native grasses can be reestablished if the seedbed is properly prepared, adapted species of native grasses are used, correct seeding practices are employed, and good management is used after seeding.

Range seedings are most successful when the seedbed is firm and has a mulch cover. A firm seedbed helps to ensure good soil-to-seed contact, which is essential for seedling development. The cover helps keep the soil moist, lowers the surface soil temperature, and reduces the hazard of erosion. A mulch cover can be provided by a temporary crop, such as sudangrass or grain sorghum. Grass seedings should be made directly into the cover crop stubble the following fall, winter, or spring. Tillage should be avoided so that a firm seedbed is maintained.

Seeding mixtures should be of adapted native grass species that occur when the site is in excellent range condition. Consequently, appropriate grass mixtures vary according to soils and range sites. Use of a grass drill with depth bands ensures the proper placement of seeds at a uniform depth in the soil.

Generally, new seedings should not be fully grazed until after the grass is established. Establishment may take from 2 to 3 years, depending on the grass species, range site, method of planting, and weather. Initial grazing of new seedings should be light. Limited grazing early in spring or late fall or winter may be desirable for weed control until the grass has become well established. Proper grazing use and a planned grazing system will help to maintain range seedings in a productive state after they are established.

Additional information on appropriate grass mixtures, grassland drills, and planting dates for range seeding can be obtained from the local office of the Natural Resources Conservation Service or the Natural Resources District.

Brush Control

Buck brush, smooth sumac, dogwood, and eastern red cedar are the main brush species in Saunders County. Although these species are currently not a major problem affecting rangeland, they have a potential to invade and increase in areas that are heavily grazed on a continuous basis. If such grazing is allowed, forage production and the carrying capacity for livestock are reduced.

Buck brush, smooth sumac, dogwood, and eastern red cedar are invading prairie uplands in fairly large numbers. Buck brush, smooth sumac, and dogwood can be controlled with the use of approved herbicides or prescribed burning. Treatment may need to be repeated several consecutive years for control of buck brush and dogwood. Herbicide recommendations are available from the county extension agent or the local office of the Natural Resources Conservation Service.

Eastern redcedar is best controlled by cutting the trees at ground level or by prescribed burning. The cutting can be done by hand or with earth moving equipment where the slope and topography are suitable. Follow-up treatment is not necessary if no green branches remain. Approved herbicides are effective in controlling eastern redcedar. Consult your Natural Resources Conservation Service office for recommendations. Implementing a planned grazing system or deferring grazing after treatment helps to restore plant vigor and forage production.

Native Woodland

In Saunders County, approximately 12,400 acres, or nearly 2.5 percent of the land base, is forested. The woodland is scattered throughout the county as small, irregular tracts along streams, on steep uplands, and on the low bottom land of the Platte River. Some fairly large blocks of woodland grow on the bluffs of the Platte River. Although these wooded areas are capable of producing commercial wood products, their esthetic properties and their importance as wildlife habitat and watershed protection are of more value.

Black walnut, bur oak, eastern cottonwood, green ash, common hackberry, and silver maple are the trees most commonly used for wood products. Black willow, boxelder, American elm, slippery elm, honeylocust, northern catalpa, and red mulberry also grow in Saunders County.

In many woodlots, the best trees have been cut for lumber, posts, poles, and firewood, and the rest of the woodland is left standing in a depleted condition. These woods can be improved if trees are protected from grazing, if undesirable trees or undesirable species are removed, and if inadequate stands are replanted.

Most of the soils in Saunders County have good potential for the production of sawtimber, firewood, Christmas trees, and other wood products, but most of these soils are in crops and are unlikely to be converted to woodland. The stream bottom can produce high value wood products within a short period of time in contrast to low value, long rotation products in the uplands. Small, isolated areas that are difficult to farm are suitable for use as woodland.

Windbreaks and Environmental Plantings

Windbreaks protect livestock, buildings, yards, fruit trees, gardens, and cropland from wind and snow; help to keep snow on fields; and provide food and cover for wildlife.

Environmental plantings can help to beautify and screen houses and other buildings and to abate noise. The plants, mostly evergreen shrubs and trees, are closely spaced. To ensure plant survival, a healthy planting stock of suitable species should be planted properly on a well prepared site and maintained in good condition.

Most farmsteads in Saunders County have trees around them that either were present when the farmstead was established or have been planted at various times. Tree planting around the farmstead is a continuing process because old trees pass maturity and deteriorate, some trees are lost to insects and disease, others are destroyed by storms, and new windbreaks are needed as a result of expanding farmsteads.

The Siberian elm is the most common tree planted around farmsteads, especially in older windbreaks. Some of the other windbreak trees are eastern redcedar, ponderosa pine, Austrian pine, Scotch pine, green ash, hackberry, honeylocust, Russian-olive, silver maple, and boxelder.

Field windbreaks are narrow plantings made at right angles to the prevailing wind and at specific intervals across the field. The interval depends on the erodibility of the soil. Field windbreaks protect cropland and crops from the wind, help to keep snow on the fields, and provide food and cover for wildlife.

The species of trees or shrubs grown as windbreaks should be those that are suited to the soils on the selected site. Choosing the proper species is the first step in ensuring plant survival and a maximum growth rate. Soil depth, texture, wetness, permeability, available water capacity, and fertility greatly affect the growth rate of trees and shrubs.

Trees and shrubs can be established easily on most of the soils in Saunders County. Competition from weeds and grasses causes most failures in windbreak planting; therefore, proper site preparation and control of weeds after planting are the major concerns when establishing and managing a windbreak.

Table 9 shows the height that locally grown trees and shrubs are expected to reach in 20 years on various soils. The estimates in the table are based on measurements and observation of established plantings that have been given adequate care. They can be used as a guide in planning windbreaks and screens.

Additional information on planning windbreaks and screens and planting and caring for trees and shrubs can be obtained from the local office of the Natural Resources Conservation Service, Cooperative Extension Service, or Nebraska Forest Service or from a commercial nursery.

Recreation

Many areas in Saunders County provide sites for hunting and fishing. In some areas, ponds in worked-out and abandoned gravel pits have been developed for recreational use. Some of these ponds are used for boating and swimming, and others, where trees and plant cover have been reestablished, are used for fishing and waterfowl hunting. Several of the larger watershed flood control structures are managed by the Natural Resources Districts and used for fishing, camping, hiking, and hunting (fig. 5).

Technical assistance for improving fish and wildlife habitat and for designing facilities for outdoor recreation is available at the local offices of the Natural Resources Conservation Service and the Lower Platte North and South Natural Resources Districts.

The soils of the survey area are rated in tables 10a and 10b according to limitations that affect their suitability for recreation. The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect the recreational uses. *Not limited* indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Somewhat limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the tables indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

Figure 5.—This watershed flood control structure is a good site for fishing and hunting.

The ratings in the tables are based on restrictive soil features, such as wetness, slope, and texture of the surface layer. Susceptibility to flooding is considered. Not considered in the ratings, but important in evaluating a site, are the location and accessibility of the area, the size and shape of the area and its scenic quality, vegetation, access to water, potential water impoundment sites, and access to public sewer lines. The capacity of the soil to absorb septic tank effluent and the ability of the soil to support vegetation also are important. Soils that are subject to flooding are limited for recreational uses by the duration and intensity of flooding and the season when flooding occurs. In planning recreational facilities, onsite assessment of the height, duration, intensity, and frequency of flooding is essential.

The information in tables 10a and 10b can be supplemented by other information in this survey, for example, interpretations for building site development, construction materials, sanitary facilities, and water management.

Camp areas require site preparation, such as shaping and leveling the tent and parking areas, stabilizing roads and intensively used areas, and installing sanitary facilities and utility lines. Camp areas are subject to heavy foot traffic and some vehicular traffic. The ratings are based on the soil properties that affect the ease of developing camp areas and the performance of the areas after development. Slope, stoniness, and depth to bedrock or a cemented pan are the main concerns affecting the development of camp areas. The soil properties that affect the performance of the areas after development are those that influence trafficability and promote the growth of vegetation, especially in heavily used areas. For good trafficability, the surface of camp areas should absorb rainfall readily, remain firm under heavy foot traffic, and not be dusty when dry. The soil properties that influence trafficability are texture of the surface layer, depth to a water table, ponding, flooding, permeability, and large stones. The soil properties that affect the growth of plants are depth to bedrock or a

cemented pan, permeability, and toxic substances in the soil.

Picnic areas are subject to heavy foot traffic. Most vehicular traffic is confined to access roads and parking areas. The ratings are based on the soil properties that affect the ease of developing picnic areas and that influence trafficability and the growth of vegetation after development. Slope and stoniness are the main concerns affecting the development of picnic areas. For good trafficability, the surface of picnic areas should absorb rainfall readily, remain firm under heavy foot traffic, and not be dusty when dry. The soil properties that influence trafficability are texture of the surface layer, depth to a water table, ponding, flooding, permeability, and large stones. The soil properties that affect the growth of plants are depth to bedrock or a cemented pan, permeability, and toxic substances in the soil.

Playgrounds require soils that are nearly level, are free of stones, and can withstand intensive foot traffic. The ratings are based on the soil properties that affect the ease of developing playgrounds and that influence trafficability and the growth of vegetation after development. Slope and stoniness are the main concerns affecting the development of playgrounds. For good trafficability, the surface of the playgrounds should absorb rainfall readily, remain firm under heavy foot traffic, and not be dusty when dry. The soil properties that influence trafficability are texture of the surface layer, depth to a water table, ponding, flooding, permeability, and large stones. The soil properties that affect the growth of plants are depth to bedrock or a cemented pan, permeability, and toxic substances in the soil.

Paths and trails for hiking and horseback riding should require little or no slope modification through cutting and filling. The ratings are based on the soil properties that affect trafficability and erodibility. These properties are stoniness, depth to a water table, ponding, flooding, slope, and texture of the surface layer.

Off-road motorcycle trails require little or no site preparation. They are not covered with surfacing material or vegetation. Considerable compaction of the soil material is likely. The ratings are based on the soil properties that influence erodibility, trafficability, dustiness, and the ease of revegetation. These properties are stoniness, slope, depth to a water table, ponding, flooding, and texture of the surface layer.

Golf fairways are subject to heavy foot traffic and some light vehicular traffic. Cutting or filling may be required. Irrigation is not considered in the ratings. The ratings are based on the soil properties that affect plant growth and trafficability after vegetation is established. The properties that affect plant growth are reaction; depth to a water table; ponding; depth to bedrock or a cemented pan; the available water capacity in the upper 40 inches; the content of salts, sodium, or calcium carbonate; and sulfidic materials. The properties that affect trafficability are flooding, depth to a water table, ponding, slope, stoniness, and the amount of sand, clay, or organic matter in the surface layer. The suitability of the soil for traps, tees, roughs, and greens is not considered in the ratings.

Wildlife Habitat

Soils affect the kind and amount of vegetation that is available to wildlife as food and cover. They also affect the construction of water impoundments. The kind and abundance of wildlife depend largely on the amount and distribution of food, cover, and water. Wildlife habitat can be created or improved by planting appropriate vegetation, by maintaining the existing plant cover, or by promoting the natural establishment of desirable plants.

In table 11, the soils in the survey area are rated according to their potential for providing habitat for various kinds of wildlife. This information can be used in planning parks, wildlife refuges, nature study areas, and other developments for wildlife; in selecting soils that are suitable for establishing, improving, or maintaining specific elements of wildlife habitat; and in determining the intensity of management needed for each element of the habitat.

The potential of the soil is rated good, fair, poor, or very poor. A rating of *good* indicates that the element or kind of habitat is easily established, improved, or maintained. Few or no limitations affect management, and satisfactory results can be expected. A rating of *fair* indicates that the element or kind of habitat can be established, improved, or maintained in most places. Moderately intensive management is required for satisfactory results. A rating of *poor* indicates that limitations are severe for the designated element or kind of habitat. Habitat can be created, improved, or maintained in most places, but management is difficult and must be intensive. A rating of *very poor* indicates that restrictions for the element or kind of habitat are very severe and that unsatisfactory results can be expected. Creating, improving, or maintaining habitat is impractical or impossible.

The elements of wildlife habitat are described in the following paragraphs.

Grain and seed crops are domestic grains and seed-producing herbaceous plants. Soil properties and features that affect the growth of grain and seed

crops are depth of the root zone, texture of the surface layer, available water capacity, wetness, slope, and flooding. Soil temperature and soil moisture also are considerations. Examples of grain and seed crops are corn, wheat, oats, and grain sorghum.

Grasses and legumes are domestic perennial grasses and herbaceous legumes. Soil properties and features that affect the growth of grasses and legumes are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, flooding, and slope. Soil temperature and soil moisture also are considerations. Examples of grasses and legumes are fescue, orchardgrass, bromegrass, clover, and alfalfa.

Wild herbaceous plants are native or naturally established grasses and forbs, including weeds. Soil properties and features that affect the growth of these plants are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, and flooding. Soil temperature and soil moisture also are considerations. Examples of wild herbaceous plants are bluestem, goldenrod, wheatgrass, and grama.

Hardwood trees and woody understory produce nuts or other fruit, buds, catkins, twigs, bark, and foliage. Soil properties and features that affect the growth of hardwood trees and shrubs are depth of the root zone, available water capacity, and wetness. Examples of these plants are bur oak, hackberry, and locust. Examples of fruit-producing shrubs that are suitable for planting on soils rated *good* are autumn-olive, American plum, common chokecherry, and cotoneaster.

Coniferous plants furnish browse and seeds. Soil properties and features that affect the growth of coniferous trees, shrubs, and ground cover are depth of the root zone, available water capacity, and wetness. Examples of coniferous plants are pine, cedar, and juniper.

Wetland plants are annual and perennial wild herbaceous plants that grow on moist or wet sites. Submerged or floating aquatic plants are excluded. Soil properties and features affecting wetland plants are texture of the surface layer, wetness, reaction, salinity, slope, and surface stoniness. Examples of wetland plants are smartweed, saltgrass, cordgrass, rushes, sedges, and reeds.

Shallow water areas have an average depth of less than 5 feet. Some are naturally wet areas. Others are created by dams, levees, or other water-control structures. Soil properties and features affecting shallow water areas are depth to bedrock, wetness, surface stoniness, slope, and permeability. Examples of shallow water areas are marshes, shallow dugouts, ditches, and ponds.

The habitat for various kinds of wildlife is described in the following paragraphs.

Habitat for openland wildlife consists of cropland, pasture, meadows, and areas that are overgrown with grasses, herbs, shrubs, and vines. These areas produce grain and seed crops, grasses and legumes, and wild herbaceous plants. Wildlife attracted to these areas include bobwhite quail, mourning dove, badger, skunk, pheasant, meadowlark, field sparrow, cottontail, and red fox.

Habitat for woodland wildlife consists of areas of deciduous and/or coniferous plants and associated grasses, legumes, and wild herbaceous plants. Wildlife attracted to these areas include wild turkey, thrushes, woodpeckers, squirrels, red fox, raccoon, white-tailed deer, and songbirds.

Habitat for wetland wildlife consists of open, marshy or swampy shallow water areas. Some of the wildlife attracted to such areas are ducks, geese, herons, shore birds, marsh wrens, muskrat, mink, and beaver (fig. 6).

Habitat for rangeland wildlife consists of areas of shrubs and wild herbaceous plants. Wildlife attracted to rangeland include antelope, deer, sage grouse, meadow lark, and lark bunting.

Engineering

This section provides information for planning land uses related to urban development and to water management. Soils are rated for various uses, and the most limiting features are identified. Ratings are given for building site development, sanitary facilities, construction materials, and water management. The ratings are based on observed performance of the soils and on the data in the tables described under the heading "Soil Properties."

Information in this section is intended for land use planning, for evaluating land use alternatives, and for planning site investigations prior to design and construction. The information, however, has limitations. For example, estimates and other data generally apply only to that part of the soil between the surface and a depth of 5 to 7 feet. Because of the map scale, small areas of different soils may be included within the mapped areas of a specific soil.

The information is not site specific and does not eliminate the need for onsite investigation of the soils or for testing and analysis by personnel experienced in the design and construction of engineering works.

Figure 6.—This depressional area in the Todd Valley ponds water for long duration and provides excellent habitat for wetland wildlife.

Government ordinances and regulations that restrict certain land uses or impose specific design criteria were not considered in preparing the information in this section. Local ordinances and regulations should be considered in planning, in site selection, and in design.

Soil properties, site features, and observed performance were considered in determining the ratings in this section. During the fieldwork for this soil survey, determinations were made about particle-size distribution, liquid limit, plasticity index, soil reaction, depth to bedrock, hardness of bedrock within 5 to 7 feet of the surface, soil wetness, depth to a water table, ponding, slope, likelihood of flooding, natural soil structure aggregation, and soil density. Data were collected about kinds of clay minerals, mineralogy of the sand and silt fractions, and the kinds of adsorbed cations. Estimates were made for erodibility, permeability, corrosivity, shrink-swell potential, available water capacity, and other behavioral characteristics affecting engineering uses.

This information can be used to evaluate the potential of areas for residential, commercial, industrial, and recreational uses; make preliminary estimates of construction conditions; evaluate alternative routes for roads, streets, highways, pipelines, and underground cables; evaluate alternative sites for sanitary landfills, septic tank absorption fields, and sewage lagoons; plan detailed onsite investigations of soils and geology; locate potential sources of gravel, sand, earthfill, and topsoil; plan drainage systems, irrigation systems, ponds, terraces, and other structures for soil and water conservation; and predict performance of proposed small structures and pavements by comparing the performance of existing similar structures on the same or similar soils.

The information in the tables, along with the soil maps, the soil descriptions, and other data provided in this survey, can be used to make additional interpretations.

Some of the terms used in this soil survey have a special meaning in soil science and are defined in the Glossary.

Building Site Development

Soil properties influence the development of building sites, including the selection of the site, the design of the structure, construction, performance after construction, and maintenance. Tables 12a and 12b show the degree and kind of soil limitations that affect dwellings with and without basements, small commercial buildings, local roads and streets, shallow excavations, and lawns and landscaping.

The ratings in the tables are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect building site development. *Not limited* indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Somewhat limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the tables indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

Dwellings are single-family houses of three stories or less. For dwellings without basements, the foundation is assumed to consist of spread footings of reinforced concrete built on undisturbed soil at a depth of 2 feet or at the depth of maximum frost penetration, whichever is deeper. For dwellings with basements, the foundation is assumed to consist of spread footings of reinforced concrete built on undisturbed soil at a depth of about 7 feet. The ratings for dwellings are based on the soil properties that affect the capacity of the soil to support a load without movement and on the properties that affect excavation and construction costs. The properties that affect the load-supporting capacity include depth to a water table, ponding, flooding, subsidence, linear extensibility (shrink-swell potential), and compressibility. Compressibility is inferred from the Unified classification. The properties that affect the ease and amount of excavation include depth to a water table, ponding, flooding, slope, depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, and the amount and size of rock fragments.

Small commercial buildings are structures that are less than three stories high and do not have basements. The foundation is assumed to consist of spread footings of reinforced concrete built on undisturbed soil at a depth of 2 feet or at the depth of maximum frost penetration, whichever is deeper. The ratings are based on the soil properties that affect the capacity of the soil to support a load without movement and on the properties that affect excavation and construction costs. The properties that affect the load-supporting capacity include depth to a water table, ponding, flooding, subsidence, linear extensibility (shrink-swell potential), and compressibility (which is inferred from the Unified classification). The properties that affect the ease and amount of excavation include flooding, depth to a water table, ponding, slope, depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, and the amount and size of rock fragments.

Local roads and streets have an all-weather surface and carry automobile and light truck traffic all year. They have a subgrade of cut or fill soil material; a base of gravel, crushed rock, or soil material stabilized by lime or cement; and a surface of flexible material (asphalt), rigid material (concrete), or gravel with a binder. The ratings are based on the soil properties that affect the ease of excavation and grading and the traffic-supporting capacity. The properties that affect the ease of excavation and grading are depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, depth to a water table, ponding, flooding, the amount of large stones, and slope. The properties that affect the traffic-supporting capacity are soil strength (as inferred from the AASHTO group index number), subsidence, linear extensibility (shrink-swell potential), the potential for frost action, depth to a water table, and ponding.

Shallow excavations are trenches or holes dug to a maximum depth of 5 or 6 feet for graves, utility lines, open ditches, or other purposes. The ratings are based on the soil properties that influence the ease of digging and the resistance to sloughing. Depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, the amount of large stones, and dense layers influence the ease of digging, filling, and compacting. Depth to the seasonal high water table, flooding, and ponding may restrict the period when excavations can be made. Slope influences the ease of using machinery. Soil texture, depth to the water table, and linear extensibility (shrink-swell potential) influence the resistance to sloughing.

Lawns and landscaping require soils on which turf and ornamental trees and shrubs can be established and maintained. Irrigation is not considered in the ratings. The ratings are based on the soil properties that affect plant growth and trafficability after vegetation is established. The properties that affect plant growth are reaction; depth to a water table; ponding; depth to bedrock or a cemented pan; the available water capacity in the upper 40 inches; the content of salts, sodium, or calcium carbonate; and sulfidic materials. The properties that affect trafficability are flooding, depth to a water table, ponding, slope, stoniness, and the amount of sand, clay, or organic matter in the surface layer.

Sanitary Facilities

Tables 13a and 13b show the degree and kind of soil limitations that affect septic tank absorption fields, sewage lagoons, sanitary landfills, and daily cover for landfill. The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect these uses. *Not limited* indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Somewhat limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the tables indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

Septic tank absorption fields are areas in which effluent from a septic tank is distributed into the soil through subsurface tiles or perforated pipe. Only that part of the soil between depths of 24 and 60 inches is evaluated. The ratings are based on the soil properties that affect absorption of the effluent, construction and maintenance of the system, and public health. Permeability, depth to a water table, ponding, depth to bedrock or a cemented pan, and flooding affect absorption of the effluent. Stones and boulders, ice, and bedrock or a cemented pan interfere with installation. Subsidence interferes with installation and maintenance. Excessive slope may cause lateral seepage and surfacing of the effluent in downslope areas.

Some soils are underlain by loose sand and gravel or fractured bedrock at a depth of less than 4 feet below the distribution lines. In these soils the absorption field may not adequately filter the effluent, particularly when the system is new. As a result, the ground water may become contaminated.

Sewage lagoons are shallow ponds constructed to hold sewage while aerobic bacteria decompose the solid and liquid wastes. Lagoons should have a nearly level floor surrounded by cut slopes or embankments of compacted soil. Nearly impervious soil material for the lagoon floor and sides is required to minimize seepage and contamination of ground water. Considered in the ratings are slope, permeability, depth to a water table, ponding, depth to bedrock or a cemented pan, flooding, large stones, and content of organic matter.

Soil permeability is a critical property affecting the suitability for sewage lagoons. Most porous soils eventually become sealed when they are used as sites for sewage lagoons. Until sealing occurs, however, the hazard of pollution is severe. Soils that have a permeability rate of more than 2 inches per hour are too porous for the proper functioning of sewage lagoons. In these soils, seepage of the effluent can result in contamination of the ground water. Ground-water contamination is also a hazard if fractured bedrock is within a depth of 40 inches, if the water table is high enough to raise the level of sewage in the lagoon, or if floodwater overtops the lagoon.

A high content of organic matter is detrimental to proper functioning of the lagoon because it inhibits aerobic activity. Slope, bedrock, and cemented pans can cause construction problems, and large stones can hinder compaction of the lagoon floor. If the lagoon is to be uniformly deep throughout, the slope must be gentle enough and the soil material must be thick enough over bedrock or a cemented pan to make land smoothing practical.

A *trench sanitary landfill* is an area where solid waste is placed in successive layers in an excavated trench. The waste is spread, compacted, and covered daily with a thin layer of soil excavated at the site. When the trench is full, a final cover of soil material at least 2 feet thick is placed over the landfill. The ratings in the table are based on the soil properties that affect the risk of pollution, the ease of excavation, trafficability, and revegetation. These properties include permeability, depth to bedrock or a cemented

pan, depth to a water table, ponding, slope, flooding, texture, stones and boulders, highly organic layers, soil reaction, and content of salts and sodium. Unless otherwise stated, the ratings apply only to that part of the soil within a depth of about 6 feet. For deeper trenches, onsite investigation may be needed.

Hard, nonrippable bedrock, creviced bedrock, or highly permeable strata in or directly below the proposed trench bottom can affect the ease of excavation and the hazard of ground-water pollution. Slope affects construction of the trenches and the movement of surface water around the landfill. It also affects the construction and performance of roads in areas of the landfill.

Soil texture and consistence affect the ease with which the trench is dug and the ease with which the soil can be used as daily or final cover. They determine the workability of the soil when dry and when wet. Soils that are plastic and sticky when wet are difficult to excavate, grade, or compact and are difficult to place as a uniformly thick cover over a layer of refuse.

The soil material used as the final cover for a trench landfill should be suitable for plants. It should not have excess sodium or salts and should not be too acid. The surface layer generally has the best workability, the highest content of organic matter, and the best potential for plants. Material from the surface layer should be stockpiled for use as the final cover.

In an *area sanitary landfill*, solid waste is placed in successive layers on the surface of the soil. The waste is spread, compacted, and covered daily with a thin layer of soil from a source away from the site. A final cover of soil material at least 2 feet thick is placed over the completed landfill. The ratings in the table are based on the soil properties that affect trafficability and the risk of pollution. These properties include flooding, permeability, depth to a water table, ponding, slope, and depth to bedrock or a cemented pan.

Flooding is a serious problem because it can result in pollution in areas downstream from the landfill. If permeability is too rapid or if fractured bedrock, a fractured cemented pan, or the water table is close to the surface, the leachate can contaminate the water supply. Slope is a consideration because of the extra grading required to maintain roads in the steeper areas of the landfill. Also, leachate may flow along the surface of the soils in the steeper areas and cause difficult seepage problems.

Daily cover for landfill is the soil material that is used to cover compacted solid waste in an area sanitary landfill. The soil material is obtained offsite, transported to the landfill, and spread over the waste. The ratings in the table also apply to the final cover for a landfill. They are based on the soil properties that affect workability, the ease of digging, and the ease of moving and spreading the material over the refuse daily during wet and dry periods. These properties include soil texture, depth to a water table, ponding, rock fragments, slope, depth to bedrock or a cemented pan, reaction, and content of salts, sodium, or lime.

Loamy or silty soils that are free of large stones and excess gravel are the best cover for a landfill. Clayey soils may be sticky and difficult to spread; sandy soils are subject to wind erosion.

Slope affects the ease of excavation and of moving the cover material. Also, it can influence runoff, erosion, and reclamation of the borrow area.

After soil material has been removed, the soil material remaining in the borrow area must be thick enough over bedrock, a cemented pan, or the water table to permit revegetation. The soil material used as the final cover for a landfill should be suitable for plants. It should not have excess sodium, salts, or lime and should not be too acid.

Agricultural Waste Management

Soil properties are important considerations in areas where soils are used as sites for the treatment and disposal of organic waste and wastewater. Selection of soils with properties that favor waste management can help to prevent environmental damage.

Tables 14a and 14b show the degree and kind of soil limitations affecting the treatment of agricultural waste, including municipal and food-processing wastewater and effluent from lagoons or storage ponds. Municipal wastewater is the waste stream from a municipality. It contains domestic waste and may contain industrial waste. It may have received primary or secondary treatment. It is rarely untreated sewage. Food-processing wastewater results from the preparation of fruits, vegetables, milk, cheese, and meats for public consumption. In places it is high in content of sodium and chloride. In the context of these tables, the effluent in lagoons and storage ponds is from facilities used to treat or store food-processing wastewater or domestic or animal waste. Domestic and food-processing wastewater is very dilute, and the effluent from the facilities that treat or store it commonly is very low in content of carbonaceous and nitrogenous material; the content of nitrogen commonly ranges from 10 to 30 milligrams per liter. The wastewater from animal waste treatment lagoons or storage ponds, however, has much higher concentrations of these materials, mainly because the manure has not been diluted as much as the domestic

waste. The content of nitrogen in this wastewater generally ranges from 50 to 2,000 milligrams per liter. When wastewater is applied, checks should be made to ensure that nitrogen, heavy metals, and salts are not added in excessive amounts.

The ratings in the tables are for waste management systems that not only dispose of and treat organic waste or wastewater but also are beneficial to crops (application of manure and food-processing waste, application of sewage sludge, and disposal of wastewater by irrigation) and for waste management systems that are designed only for the purpose of wastewater disposal and treatment (overland flow of wastewater, rapid infiltration of wastewater, and slow rate treatment of wastewater).

The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect agricultural waste management. *Not limited* indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Somewhat limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the tables indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

Application of manure and food-processing waste not only disposes of waste material but also can improve crop production by increasing the supply of nutrients in the soils where the material is applied. Manure is the excrement of livestock and poultry, and food-processing waste is damaged fruit and vegetables and the peelings, stems, leaves, pits, and soil particles removed in food preparation. The manure and food-processing waste are either solid, slurry, or liquid. Their nitrogen content varies. A high content of nitrogen limits the application rate. Toxic or otherwise dangerous wastes, such as those mixed with the lye used in food processing, are not considered in the ratings.

The ratings are based on the soil properties that affect absorption, plant growth, microbial activity, erodibility, the rate at which the waste is applied, and the method by which the waste is applied. The properties that affect absorption include permeability, depth to a water table, ponding, the sodium adsorption ratio, depth to bedrock or a cemented pan, and available water capacity. The properties that affect plant growth and microbial activity include reaction, the sodium adsorption ratio, salinity, and bulk density. The wind erodibility group, the soil erodibility factor K, and slope are considered in estimating the likelihood that wind erosion or water erosion will transport the waste material from the application site. Stones, cobbles, a water table, ponding, and flooding can hinder the application of waste. Permanently frozen soils are unsuitable for waste treatment.

Application of sewage sludge not only disposes of waste material but also can improve crop production by increasing the supply of nutrients in the soils where the material is applied. In the context of this table, sewage sludge is the residual product of the treatment of municipal sewage. The solid component consists mainly of cell mass, primarily bacteria cells that developed during secondary treatment and have incorporated soluble organics into their own bodies. The sludge has small amounts of sand, silt, and other solid debris. The content of nitrogen varies. Some sludge has constituents that are toxic to plants or hazardous to the food chain, such as heavy metals and exotic organic compounds, and should be analyzed chemically prior to use.

The content of water in the sludge ranges from about 98 percent to less than 40 percent. The sludge is considered liquid if it is more than about 90 percent water, slurry if it is about 50 to 90 percent water, and solid if it is less than about 50 percent water.

The ratings in the table are based on the soil properties that affect absorption, plant growth, microbial activity, erodibility, the rate at which the sludge is applied, and the method by which the sludge is applied. The properties that affect absorption, plant growth, and microbial activity include permeability, depth to a water table, ponding, the sodium adsorption ratio, depth to bedrock or a cemented pan, available water capacity, reaction, salinity, and bulk density. The wind erodibility group, the soil erodibility factor K, and slope are considered in estimating the likelihood that wind erosion or water erosion will transport the waste material from the application site. Stones, cobbles, a water table, ponding, and flooding can hinder the application of sludge. Permanently frozen soils are unsuitable for waste treatment.

Disposal of wastewater by irrigation not only disposes of municipal wastewater and wastewater from food-processing plants, lagoons, and storage

ponds but also can improve crop production by increasing the amount of water available to crops. The ratings in the table are based on the soil properties that affect the design, construction, management, and performance of the irrigation system. The properties that affect design and management include the sodium adsorption ratio, depth to a water table, ponding, available water capacity, permeability, slope, and flooding. The properties that affect construction include stones, cobbles, depth to bedrock or a cemented pan, depth to a water table, and ponding. The properties that affect performance include depth to bedrock or a cemented pan, bulk density, the sodium adsorption ratio, salinity, reaction, and the cation-exchange capacity, which is used to estimate the capacity of a soil to adsorb heavy metals. Permanently frozen soils are not suitable for disposal of wastewater by irrigation.

Overland flow of wastewater is a process in which wastewater is applied to the upper reaches of sloped land and allowed to flow across vegetated surfaces, sometimes called terraces, to runoff-collection ditches. The length of the run generally is 150 to 300 feet. The application rate ranges from 2.5 to 16.0 inches per week. It commonly exceeds the rate needed for irrigation of cropland. The wastewater leaves solids and nutrients on the vegetated surfaces as it flows downslope in a thin film. Most of the water reaches the collection ditch, some is lost through evapotranspiration, and a small amount may percolate to the ground water.

The ratings in the table are based on the soil properties that affect absorption, plant growth, microbial activity, and the design and construction of the system. Reaction and the cation-exchange capacity affect absorption. Reaction, salinity, and the sodium adsorption ratio affect plant growth and microbial activity. Slope, permeability, depth to a water table, ponding, flooding, depth to bedrock or a cemented pan, stones, and cobbles affect design and construction. Permanently frozen soils are unsuitable for waste treatment.

Rapid infiltration of wastewater is a process in which wastewater applied in a level basin at a rate of 4 to 120 inches per week percolates through the soil. The wastewater may eventually reach the ground water. The application rate commonly exceeds the rate needed for irrigation of cropland. Vegetation is not a necessary part of the treatment; hence, the basins may or may not be vegetated. The thickness of the soil material needed for proper treatment of the wastewater is more than 72 inches. As a result, geologic and hydrologic investigation is needed to ensure proper design and performance and to determine the risk of ground-water pollution.

The ratings in the table are based on the soil properties that affect the risk of pollution and the design, construction, and performance of the system. Depth to a water table, ponding, flooding, and depth to bedrock or a cemented pan affect the risk of pollution and the design and construction of the system. Slope, stones, and cobbles also affect design and construction. Permeability and reaction affect performance. Permanently frozen soils are unsuitable for waste treatment.

Slow rate treatment of wastewater is a process in which wastewater is applied to land at a rate normally between 0.5 inch and 4.0 inches per week. The application rate commonly exceeds the rate needed for irrigation of cropland. The applied wastewater is treated as it moves through the soil. Much of the treated water may percolate to the ground water, and some enters the atmosphere through evapotranspiration. The applied water generally is not allowed to run off the surface. Waterlogging is prevented either through control of the application rate or through the use of tile drains, or both.

The ratings in the table are based on the soil properties that affect absorption, plant growth, microbial activity, erodibility, and the application of waste. The properties that affect absorption include the sodium adsorption ratio, depth to a water table, ponding, available water capacity, permeability, depth to bedrock or a cemented pan, reaction, the cation-exchange capacity, and slope. Reaction, the sodium adsorption ratio, salinity, and bulk density affect plant growth and microbial activity. The wind erodibility group, the soil erodibility factor K, and slope are considered in estimating the likelihood of wind erosion or water erosion. Stones, cobbles, a water table, ponding, and flooding can hinder the application of waste. Permanently frozen soils are unsuitable for waste treatment.

Construction Materials

Tables 15a and 15b give information about the soils as potential sources of gravel, sand, topsoil, reclamation material, and roadfill. Normal compaction, minor processing, and other standard construction practices are assumed.

Gravel and *sand* are natural aggregates suitable for commercial use with a minimum of processing. They are used in many kinds of construction. Specifications for each use vary widely. In table 15a, only the likelihood of finding material in suitable quantity is

evaluated. The suitability of the material for specific purposes is not evaluated, nor are factors that affect excavation of the material. The properties used to evaluate the soil as a source of sand or gravel are gradation of grain sizes (as indicated by the Unified classification of the soil), the thickness of suitable material, and the content of rock fragments. If the bottom layer of the soil contains sand or gravel, the soil is considered a likely source regardless of thickness. The assumption is that the gravel or sand layer below the depth of observation exceeds the minimum thickness.

The soils are rated *good, fair,* or *poor* as potential sources of sand and gravel. A rating of *good* or *fair* means that the source material is likely to be in or below the soil. The bottom layer and the thickest layer of the soils are assigned numerical ratings. These ratings indicate the likelihood that the layer is a source of sand or gravel. The number 0.00 indicates that the layer is a poor source. The number 1.00 indicates that the layer is a good source. A number between 0.00 and 1.00 indicates the degree to which the layer is a likely source.

The soils are rated *good, fair,* or *poor* as potential sources of topsoil, reclamation material, and roadfill. The features that limit the soils as sources of these materials are specified in the tables. The numerical ratings given after the specified features indicate the degree to which the features limit the soils as sources of topsoil, reclamation material, or roadfill. The lower the number, the greater the limitation.

Reclamation material is used in areas that have been drastically disturbed by surface mining or similar activities. When these areas are reclaimed, layers of soil material or unconsolidated geological material, or both, are replaced in a vertical sequence. The reconstructed soil favors plant growth. The ratings in the table do not apply to quarries and other mined areas that require an offsite source of reconstruction material. The ratings are based on the soil properties that affect erosion and stability of the surface and the productive potential of the reconstructed soil. These properties include the content of sodium, salts, and calcium carbonate; reaction; available water capacity; erodibility; texture; content of rock fragments; and content of organic matter and other features that affect fertility.

Roadfill is soil material that is excavated in one place and used in road embankments in another place. In this table, the soils are rated as a source of roadfill for low embankments, generally less than 6 feet high and less exacting in design than higher embankments.

The ratings are for the whole soil, from the surface to a depth of about 5 feet. It is assumed that soil layers will be mixed when the soil material is excavated and spread.

The ratings are based on the amount of suitable material and on soil properties that affect the ease of excavation and the performance of the material after it is in place. The thickness of the suitable material is a major consideration. The ease of excavation is affected by large stones, depth to a water table, and slope. How well the soil performs in place after it has been compacted and drained is determined by its strength (as inferred from the AASHTO classification of the soil) and linear extensibility (shrink-swell potential).

Topsoil is used to cover an area so that vegetation can be established and maintained. The upper 40 inches of a soil is evaluated for use as topsoil. Also evaluated is the reclamation potential of the borrow area. The ratings are based on the soil properties that affect plant growth; the ease of excavating, loading, and spreading the material; and reclamation of the borrow area. Toxic substances, soil reaction, and the properties that are inferred from soil texture, such as available water capacity and fertility, affect plant growth. The ease of excavating, loading, and spreading is affected by rock fragments, slope, depth to a water table, soil texture, and thickness of suitable material. Reclamation of the borrow area is affected by slope, depth to a water table, rock fragments, depth to bedrock or a cemented pan, and toxic material.

The surface layer of most soils is generally preferred for topsoil because of its organic matter content. Organic matter greatly increases the absorption and retention of moisture and nutrients for plant growth.

Water Management

Table 16 gives information on the soil properties and site features that affect water management. The degree and kind of soil limitations are given for pond reservoir areas; embankments, dikes, and levees; and aquifer-fed excavated ponds. The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect these uses. *Not limited* indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Somewhat limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or

installation. Fair performance and moderate maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the tables indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

Pond reservoir areas hold water behind a dam or embankment. Soils best suited to this use have low seepage potential in the upper 60 inches. The seepage potential is determined by the permeability of the soil and the depth to fractured bedrock or other permeable material. Excessive slope can affect the storage capacity of the reservoir area.

Embankments, dikes, and levees are raised structures of soil material, generally less than 20 feet high, constructed to impound water or to protect land against overflow. Embankments that have zoned construction (core and shell) are not considered. In this table, the soils are rated as a source of material for embankment fill. The ratings apply to the soil material below the surface layer to a depth of about 5 feet. It is assumed that soil layers will be uniformly mixed and compacted during construction.

The ratings do not indicate the ability of the natural soil to support an embankment. Soil properties to a depth even greater than the height of the embankment can affect performance and safety of the embankment. Generally, deeper onsite investigation is needed to determine these properties.

Soil material in embankments must be resistant to seepage, piping, and erosion and have favorable compaction characteristics. Unfavorable features include less than 5 feet of suitable material and a high content of stones or boulders, organic matter, or salts or sodium. A high water table affects the amount of usable material. It also affects trafficability.

Aquifer-fed excavated ponds are pits or dugouts that extend to a ground-water aquifer or to a depth below a permanent water table. Excluded are ponds that are fed only by surface runoff and embankment ponds that impound water 3 feet or more above the original surface. Excavated ponds are affected by depth to a permanent water table, permeability of the aquifer, and quality of the water as inferred from the salinity of the soil. Depth to bedrock and the content of large stones affect the ease of excavation.

Soil Properties

Data relating to soil properties are collected during the course of the soil survey.

Soil properties are ascertained by field examination of the soils and by laboratory index testing of some benchmark soils. Established standard procedures are followed. During the survey, many shallow borings are made and examined to identify and classify the soils and to delineate them on the soil maps. Samples are taken from some typical profiles and tested in the laboratory to determine particle-size distribution, plasticity, and compaction characteristics.

Estimates of soil properties are based on field examinations, on laboratory tests of samples from the survey area, and on laboratory tests of samples of similar soils in nearby areas. Tests verify field observations, verify properties that cannot be estimated accurately by field observation, and help to characterize key soils.

The estimates of soil properties are shown in tables. They include engineering index properties, physical and chemical properties, and pertinent soil and water features.

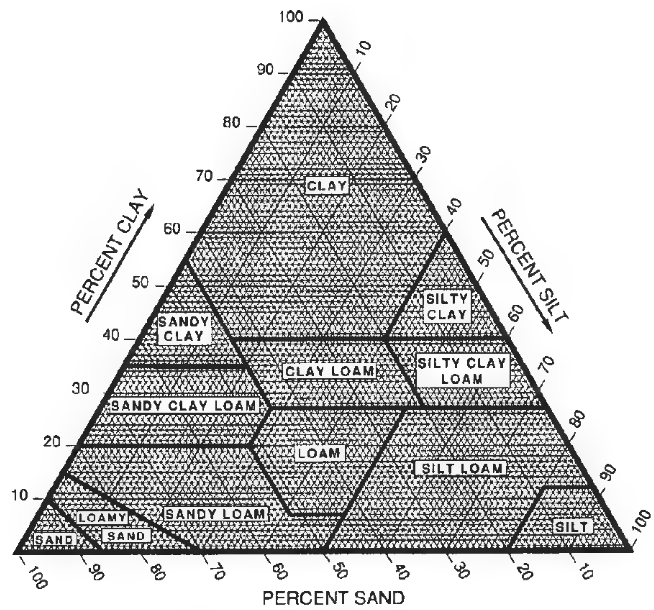

Figure 7.—Percentages of clay, silt, and sand in the basic USDA soil textural classes.

Engineering Index Properties

Table 17 gives the engineering classifications and the range of index properties for the layers of each soil in the survey area.

Depth to the upper and lower boundaries of each layer is indicated.

Texture is given in the standard terms used by the U.S. Department of Agriculture. These terms are defined according to percentages of sand, silt, and clay in the fraction of the soil that is less than 2 millimeters in diameter. "Loam," for example, is soil that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand (fig. 7). If the content of particles coarser than sand is 15 percent or more, an appropriate modifier is added, for example, "gravelly." Textural terms are defined in the Glossary.

Classification of the soils is determined according to the Unified soil classification system (ASTM, 2001) and the system adopted by the American Association of State Highway and Transportation Officials (AASHTO, 2000).

The Unified system classifies soils according to properties that affect their use as construction material. Soils are classified according to particle-size distribution of the fraction less than 3 inches in diameter and according to plasticity index, liquid limit, and organic matter content. Sandy and gravelly soils are identified as GW, GP, GM, GC, SW, SP, SM, and SC; silty and clayey soils as ML, CL, OL, MH, CH, and OH; and highly organic soils as PT. Soils exhibiting engineering properties of two groups can have a dual classification, for example, CL-ML.

The AASHTO system classifies soils according to those properties that affect roadway construction and maintenance. In this system, the fraction of a mineral soil that is less than 3 inches in diameter is classified in one of seven groups from A-1 through A-7 on the basis of particle-size distribution, liquid limit, and plasticity index. Soils in group A-1 are coarse grained and low in content of fines (silt and clay). At the other extreme, soils in group A-7 are fine grained. Highly organic soils are classified in group A-8 on the basis of visual inspection.

If laboratory data are available, the A-1, A-2, and A-7 groups are further classified as A-1-a, A-1-b, A-2-4, A-2-5, A-2-6, A-2-7, A-7-5, or A-7-6. As an additional refinement, the suitability of a soil as subgrade material can be indicated by a group index number. Group index numbers range from 0 for the best subgrade material to 20 or higher for the poorest.

Rock fragments larger than 10 inches in diameter and 3 to 10 inches in diameter are indicated as a percentage of the total soil on a dry-weight basis. The percentages are estimates determined mainly by converting volume percentage in the field to weight percentage.

Percentage (of soil particles) passing designated sieves is the percentage of the soil fraction less than 3 inches in diameter based on an ovendry weight. The sieves, numbers 4, 10, 40, and 200 (USA Standard Series), have openings of 4.76, 2.00, 0.420, and 0.074 millimeters, respectively. Estimates are based on laboratory tests of soils sampled in the survey area and in nearby areas and on estimates made in the field.

Liquid limit and *plasticity index* (Atterberg limits) indicate the plasticity characteristics of a soil. The estimates are based on test data from the survey area or from nearby areas and on field examination.

The estimates of particle-size distribution, liquid limit, and plasticity index are generally rounded to the nearest 5 percent. Thus, if the ranges of gradation and Atterberg limits extend a marginal amount (1 or 2 percentage points) across classification boundaries, the classification in the marginal zone is generally omitted in the table.

Physical Properties

Table 18 shows estimates of some physical characteristics and features that affect soil behavior. These estimates are given for the layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Depth to the upper and lower boundaries of each layer is indicated.

Particle size is the effective diameter of a soil particle as measured by sedimentation, sieving, or micrometric methods. Particle sizes are expressed as classes with specific effective diameter class limits. The broad classes are sand, silt, and clay, ranging from the larger to the smaller.

Sand as a soil separate consists of mineral soil particles that are 0.05 millimeter to 2 millimeters in diameter. In table 18, the estimated sand content of each soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

Silt as a soil separate consists of mineral soil particles that are 0.002 to 0.05 millimeter in diameter. In table 18, the estimated silt content of each soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

Clay as a soil separate consists of mineral soil particles that are less than 0.002 millimeter in diameter. In table 18, the estimated clay content of each soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The content of sand, silt, and clay affects the physical behavior of a soil. Particle size is important for engineering and agronomic interpretations, for determination of soil hydrologic qualities, and for soil classification.

The amount and kind of clay affect the fertility and physical condition of the soil and the ability of the soil to adsorb cations and to retain moisture. They influence shrink-swell potential, permeability, plasticity, the ease of soil dispersion, and other soil properties. The amount and kind of clay in a soil also affect tillage and earthmoving operations.

Moist bulk density is the weight of soil (ovendry) per unit volume. Volume is measured when the soil is at field moisture capacity, that is, the moisture content at 1/3- or 1/10-bar (33kPa or 10kPa) moisture tension. Weight is determined after the soil is dried at 105 degrees C. In the table, the estimated moist bulk density of each soil horizon is expressed in grams per cubic centimeter of soil material that is less than 2 millimeters in diameter. Bulk density data are used to compute shrink-swell potential, available water capacity, total pore space, and other soil properties. The moist bulk density of a soil indicates the pore space available for water and roots. Depending on soil texture, a bulk density of more than 1.4 can restrict water storage and root penetration. Moist bulk density is influenced by texture, kind of clay, content of organic matter, and soil structure.

Permeability (K_{sat}) refers to the ability of a soil to transmit water or air. The term “permeability,” as used in soil surveys, indicates saturated hydraulic conductivity (K_{sat}). The estimates in the table indicate the rate of water movement, in inches per hour, when the soil is saturated. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Permeability is considered in the design of soil drainage systems and septic tank absorption fields.

Available water capacity refers to the quantity of water that the soil is capable of storing for use by

plants. The capacity for water storage is given in inches of water per inch of soil for each soil layer. The capacity varies, depending on soil properties that affect retention of water. The most important properties are the content of organic matter, soil texture, bulk density, and soil structure. Available water capacity is an important factor in the choice of plants or crops to be grown and in the design and management of irrigation systems. Available water capacity is not an estimate of the quantity of water actually available to plants at any given time.

Linear extensibility refers to the change in length of an unconfined clod as moisture content is decreased from a moist to a dry state. It is an expression of the volume change between the water content of the clod at 1/3- or 1/10-bar tension (33kPa or 10kPa tension) and oven dryness. The volume change is reported in the table as percent change for the whole soil. Volume change is influenced by the amount and type of clay minerals in the soil.

Linear extensibility is used to determine the shrink-swell potential of soils. The shrink-swell potential is low if the soil has a linear extensibility of less than 3 percent; moderate if 3 to 6 percent; high if 6 to 9 percent; and very high if more than 9 percent. If the linear extensibility is more than 3, shrinking and swelling can cause damage to buildings, roads, and other structures and to plant roots. Special design commonly is needed.

Organic matter is the plant and animal residue in the soil at various stages of decomposition. In table 18, the estimated content of organic matter is expressed as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The content of organic matter in a soil can be maintained by returning crop residue to the soil. Organic matter has a positive effect on available water capacity, water infiltration, soil organism activity, and tilth. It is a source of nitrogen and other nutrients for crops and soil organisms.

Erosion factors are shown in table 18 as the K factor (Kw and Kf) and the T factor. Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of several factors used in the Universal Soil Loss Equation (USLE) and the Revised Universal Soil Loss Equation (RUSLE) to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, sand, and organic matter and on soil structure and permeability. Values of K range from 0.02 to 0.69. Other factors being equal, the higher the value, the more susceptible the soil is to sheet and rill erosion by water.

Erosion factor Kw indicates the erodibility of the whole soil. The estimates are modified by the presence of rock fragments.

Erosion factor Kf indicates the erodibility of the fine-earth fraction, or the material less than 2 millimeters in size.

Erosion factor T is an estimate of the maximum average annual rate of soil erosion by wind or water that can occur without affecting crop productivity over a sustained period. The rate is in tons per acre per year.

Wind erodibility groups are made up of soils that have similar properties affecting their susceptibility to wind erosion in cultivated areas. The soils assigned to group 1 are the most susceptible to wind erosion, and those assigned to group 8 are the least susceptible. The groups are as follows:

1. Coarse sands, sands, fine sands, and very fine sands.

2. Loamy coarse sands, loamy sands, loamy fine sands, loamy very fine sands, ash material, and sapric soil material.

3. Coarse sandy loams, sandy loams, fine sandy loams, and very fine sandy loams.

4L. Calcareous loams, silt loams, clay loams, and silty clay loams.

4. Clays, silty clays, noncalcareous clay loams, and silty clay loams that are more than 35 percent clay.

5. Noncalcareous loams and silt loams that are less than 20 percent clay and sandy clay loams, sandy clays, and hemic soil material.

6. Noncalcareous loams and silt loams that are more than 20 percent clay and noncalcareous clay loams that are less than 35 percent clay.

7. Silts, noncalcareous silty clay loams that are less than 35 percent clay, and fibric soil material.

8. Soils that are not subject to wind erosion because of rock fragments on the surface or because of surface wetness.

Wind erodibility index is a numerical value indicating the susceptibility of soil to wind erosion, or the tons per acre per year that can be expected to be lost to wind erosion. There is a close correlation between wind erosion and the texture of the surface layer, the size and durability of surface clods, rock fragments, organic matter, and a calcareous reaction. Soil moisture and frozen soil layers also influence wind erosion.

Chemical Properties

Table 19 shows estimates of some chemical characteristics and features that affect soil behavior. These estimates are given for the layers of each soil in

the survey area. The estimates are based on field observations and on test data for these and similar soils.

Depth to the upper and lower boundaries of each layer is indicated.

Cation-exchange capacity is the total amount of extractable bases that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. Soils having a low cation-exchange capacity hold fewer cations and may require more frequent applications of fertilizer than soils having a high cation-exchange capacity. The ability to retain cations reduces the hazard of ground-water pollution.

Soil reaction is a measure of acidity or alkalinity. The pH of each soil horizon is based on many field tests. For many soils, values have been verified by laboratory analyses. Soil reaction is important in selecting crops and other plants, in evaluating soil amendments for fertility and stabilization, and in determining the risk of corrosion.

Calcium carbonate equivalent is the percent of carbonates, by weight, in the fraction of the soil less than 2 millimeters in size. The availability of plant nutrients is influenced by the amount of carbonates in the soil. Incorporating nitrogen fertilizer into calcareous soils helps to prevent nitrite accumulation and ammonium-N volatilization.

Gypsum is expressed as a percent, by weight, of hydrated calcium sulfates in the fraction of the soil less than 20 millimeters in size. Gypsum is partially soluble in water. Soils that have a high content of gypsum may collapse if the gypsum is removed by percolating water.

Salinity is a measure of soluble salts in the soil at saturation. It is expressed as the electrical conductivity of the saturation extract, in millimhos per centimeter at 25 degrees C. Estimates are based on field and laboratory measurements at representative sites of nonirrigated soils. The salinity of irrigated soils is affected by the quality of the irrigation water and by the frequency of water application. Hence, the salinity of soils in individual fields can differ greatly from the value given in the table. Salinity affects the suitability of a soil for crop production, the stability of soil if used as construction material, and the potential of the soil to corrode metal and concrete.

Sodium adsorption ratio (SAR) is a measure of the amount of sodium (Na) relative to calcium (Ca) and magnesium (Mg) in the water extract from saturated soil paste. It is the ratio of the Na concentration divided by the square root of one-half of the Ca + Mg concentration. Soils that have SAR values of 13 or more may be characterized by an increased dispersion of organic matter and clay particles, reduced permeability and aeration, and a general degradation of soil structure.

Soil Features

Table 20 gives estimates of various soil features. The estimates are used in land use planning that involves engineering considerations.

A *restrictive layer* is a nearly continuous layer that has one or more physical, chemical, or thermal properties that significantly impede the movement of water and air through the soil or that restrict roots or otherwise provide an unfavorable root environment. Examples are bedrock, cemented layers, dense layers, and frozen layers. The table indicates the hardness of the restrictive layer, which significantly affects the ease of excavation. *Depth to top* is the vertical distance from the soil surface to the upper boundary of the restrictive layer.

Potential for frost action is the likelihood of upward or lateral expansion of the soil caused by the formation of segregated ice lenses (frost heave) and the subsequent collapse of the soil and loss of strength on thawing. Frost action occurs when moisture moves into the freezing zone of the soil. Temperature, texture, density, permeability, content of organic matter, and depth to the water table are the most important factors considered in evaluating the potential for frost action. It is assumed that the soil is not insulated by vegetation or snow and is not artificially drained. Silty and highly structured, clayey soils that have a high water table in winter are the most susceptible to frost action. Well drained, very gravelly, or very sandy soils are the least susceptible. Frost heave and low soil strength during thawing cause damage to pavements and other rigid structures.

Risk of corrosion pertains to potential soil-induced electrochemical or chemical action that corrodes or weakens uncoated steel or concrete. The rate of corrosion of uncoated steel is related to such factors as soil moisture, particle-size distribution, acidity, and electrical conductivity of the soil. The rate of corrosion of concrete is based mainly on the sulfate and sodium content, texture, moisture content, and acidity of the soil. Special site examination and design may be needed if the combination of factors results in a severe hazard of corrosion. The steel or concrete in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than the steel or concrete in installations that are entirely within one kind of soil or within one soil layer.

For uncoated steel, the risk of corrosion, expressed as *low, moderate,* or *high,* is based on soil drainage

class, total acidity, electrical resistivity near field capacity, and electrical conductivity of the saturation extract.

For concrete, the risk of corrosion also is expressed as *low, moderate,* or *high.* It is based on soil texture, acidity, and amount of sulfates in the saturation extract.

Water Features

Table 21 gives estimates of various water features. The estimates are used in land use planning that involves engineering considerations.

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The four hydrologic soil groups are:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

The *months* in the table indicate the portion of the year in which the feature is most likely to be a concern.

Water table refers to a saturated zone in the soil. Table 21 indicates, by month, depth to the top (*upper limit*) and base (*lower limit*) of the saturated zone in most years. Estimates of the upper and lower limits are based mainly on observations of the water table at selected sites and on evidence of a saturated zone, namely grayish colors or mottles (redoximorphic features) in the soil. A saturated zone that lasts for less than a month is not considered a water table.

Ponding is standing water in a closed depression. Unless a drainage system is installed, the water is removed only by percolation, transpiration, or evaporation. Table 21 indicates *surface water depth* and the *duration* and *frequency* of ponding. Duration is expressed as *very brief* if less than 2 days, *brief* if 2 to 7 days, *long* if 7 to 30 days, and *very long* if more than 30 days. Frequency is expressed as none, rare, occasional, and frequent. *None* means that ponding is not probable; *rare* that it is unlikely but possible under unusual weather conditions (the chance of ponding is nearly 0 percent to 5 percent in any year); *occasional* that it occurs, on the average, once or less in 2 years (the chance of ponding is 5 to 50 percent in any year); and *frequent* that it occurs, on the average, more than once in 2 years (the chance of ponding is more than 50 percent in any year).

Flooding is the temporary inundation of an area caused by overflowing streams, by runoff from adjacent slopes, or by tides. Water standing for short periods after rainfall or snowmelt is not considered flooding, and water standing in swamps and marshes is considered ponding rather than flooding.

Duration and *frequency* are estimated. Duration is expressed as *extremely brief* if 0.1 hour to 4 hours, *very brief* if 4 hours to 2 days, *brief* if 2 to 7 days, *long* if 7 to 30 days, and *very long* if more than 30 days. Frequency is expressed as none, very rare, rare, occasional, frequent, and very frequent. *None* means that flooding is not probable; *very rare* that it is very unlikely but possible under extremely unusual weather conditions (the chance of flooding is less than 1 percent in any year); *rare* that it is unlikely but possible under unusual weather conditions (the chance of flooding is 1 to 5 percent in any year); *occasional* that it occurs infrequently under normal weather conditions (the chance of flooding is 5 to 50 percent in any year); *frequent* that it is likely to occur often under normal weather conditions (the chance of flooding is more than 50 percent in any year but is less than 50 percent in all months in any year); and *very frequent* that it is likely to occur very often under normal weather conditions (the chance of flooding is more than 50 percent in all months of any year).

The information is based on evidence in the soil profile, namely thin strata of gravel, sand, silt, or clay deposited by floodwater; irregular decrease in organic matter content with increasing depth; and little or no horizon development.

Also considered are local information about the extent and levels of flooding and the relation of each soil on the landscape to historic floods. Information on the extent of flooding based on soil data is less specific than that provided by detailed engineering surveys that delineate flood-prone areas at specific flood frequency levels.

Classification of the Soils

The system of soil classification used by the National Cooperative Soil Survey has six categories (Soil Survey Staff, 1998 and 1999). Beginning with the broadest, these categories are the order, suborder, great group, subgroup, family, and series. Classification is based on soil properties observed in the field or inferred from those observations or from laboratory measurements. Table 22 shows the classification of the soils in the survey area. The categories are defined in the following paragraphs.

ORDER. Twelve soil orders are recognized. The differences among orders reflect the dominant soil-forming processes and the degree of soil formation. Each order is identified by a word ending in *sol*. An example is Alfisol.

SUBORDER. Each order is divided into suborders primarily on the basis of properties that influence soil genesis and are important to plant growth or properties that reflect the most important variables within the orders. The last syllable in the name of a suborder indicates the order. An example is Udalf (*Ud*, meaning humid, plus *alf*, from Alfisol).

GREAT GROUP. Each suborder is divided into great groups on the basis of close similarities in kind, arrangement, and degree of development of pedogenic horizons; soil moisture and temperature regimes; type of saturation; and base status. Each great group is identified by the name of a suborder and by a prefix that indicates a property of the soil. An example is Hapludalfs (*Hapl*, meaning minimal horizonation, plus *udalf*, the suborder of the Alfisols that has a udic moisture regime).

SUBGROUP. Each great group has a typic subgroup. Other subgroups are intergrades or extragrades. The typic subgroup is the central concept of the great group; it is not necessarily the most extensive. Intergrades are transitions to other orders, suborders, or great groups. Extragrades have some properties that are not representative of the great group but do not indicate transitions to any other taxonomic class. Each subgroup is identified by one or more adjectives preceding the name of the great group. An example is Mollic Hapludalfs.

FAMILY. Families are established within a subgroup on the basis of physical and chemical properties and other characteristics that affect management. Generally, the properties are those of horizons below plow depth where there is much biological activity. Among the properties and characteristics considered are particle-size class, mineralogy class, cation-exchange activity class, soil temperature regime, soil depth, and reaction class. A family name consists of the name of a subgroup preceded by terms that indicate soil properties. An example is fine-silty, mixed, superactive, mesic Mollic Hapludalfs.

SERIES. The series consists of soils within a family that have horizons similar in color, texture, structure, reaction, consistence, mineral and chemical composition, and arrangement in the profile.

Soil Series and Their Morphology

In this section, each soil series recognized in the survey area is described. Characteristics of the soil and the material in which it formed are identified for each series. A pedon, a small three-dimensional area of soil, that is typical of the series in the survey area is described. The detailed description of each soil horizon follows standards in the "Soil Survey Manual" (Soil Survey Division Staff, 1993). Many of the technical terms used in the descriptions are defined in "Soil Taxonomy" (Soil Survey Staff, 1999) and in "Keys to Soil Taxonomy" (Soil Survey Staff, 1998). Following the pedon description is the range of important characteristics of the soils in the series.

Aksarben Series

The Aksarben series consists of very deep, well drained soils that formed in loess. These soils are on uplands. Permeability is moderately slow. Slopes range from 0 to 11 percent. The mean annual temperature is about 52 degrees F, and the mean annual precipitation is about 29 inches.

Taxonomic classification: Fine, smectitic, mesic Typic Argiudolls

Typical Pedon

Aksarben silty clay loam, on a convex slope of 1 percent, in a cultivated field about 6 miles south and 4 miles east of Wahoo, in Saunders County, Nebraska; 810 feet north and 1,875 feet west of the southeast corner of sec. 4, T. 13 N., R. 8 E.; Wahoo SE. USGS topographic quadrangle; lat. 41 degrees 07 minutes 12 seconds N. and long. 96 degrees 31 minutes 39 seconds W. (Colors are for moist soil unless otherwise indicated.)

Ap—0 to 6 inches; very dark grayish brown (10YR 3/2) silty clay loam, dark grayish brown (10YR 4/2) dry; weak fine granular structure; slightly hard, friable; many very fine and fine roots throughout; many fine and medium tubular pores; moderately acid; abrupt smooth boundary.

A—6 to 12 inches; very dark grayish brown (10YR 3/2) silty clay loam, dark grayish brown (10YR 4/2) dry; weak fine subangular blocky structure parting to weak fine granular; slightly hard, friable; many very fine and fine roots throughout; many fine and medium tubular pores; moderately acid; clear smooth boundary.

Bt1—12 to 18 inches; dark brown (10YR 3/3) silty clay loam, brown (10YR 5/3) dry; moderate medium subangular blocky structure parting to strong fine subangular blocky; hard, firm; common fine roots throughout; common fine tubular pores; many faint very dark grayish brown (10YR 3/2) continuous clay films (cutans) on vertical and horizontal faces of peds; slightly acid; clear smooth boundary.

Bt2—18 to 26 inches; brown (10YR 4/3) silty clay loam, brown (10YR 5/3) dry; few fine faint dark yellowish brown (10YR 4/6) iron masses in the soil matrix; the iron accumulations are relict redoximorphic features; moderate coarse subangular blocky structure parting to strong fine and medium subangular blocky; hard, firm; few fine roots throughout; few fine tubular pores; many faint dark brown (10YR 3/3) continuous clay films (cutans) on vertical and horizontal faces of peds; few fine irregular soft masses of iron-manganese; slightly acid; gradual smooth boundary.

Bt3—26 to 34 inches; brown (10YR 4/3) silty clay loam, pale brown (10YR 6/3) dry; prominent strong brown (7.5YR 5/6) iron masses in the soil matrix; the iron accumulations are relict redoximorphic features; moderate coarse prismatic structure parting to strong medium subangular blocky; hard, firm; few very fine roots throughout; few very fine tubular pores; many faint dark brown (10YR 3/3) continuous clay films (cutans) on vertical and horizontal faces of peds; common fine irregular soft masses of iron-manganese; slightly acid; gradual smooth boundary.

Bt4—34 to 42 inches; brown (10YR 5/3) silty clay loam, pale brown (10YR 6/3) dry; prominent strong brown (7.5YR 5/6) iron masses in the soil matrix; the iron accumulations are relict redoximorphic features; strong coarse prismatic structure parting to moderate medium subangular blocky; hard, firm; few very fine roots throughout; common very fine tubular pores; common distinct brown (10YR 4/3) discontinuous clay films (cutans) on vertical and horizontal faces of peds; common fine irregular soft masses of iron-manganese; slightly acid; gradual smooth boundary.

BC—42 to 60 inches; brown (10YR 5/3) silty clay loam, very pale brown (10YR 7/3) dry; many coarse distinct yellowish brown (10YR 5/6) iron masses in the soil matrix; the iron accumulations are relict redoximorphic features; weak coarse prismatic structure parting to moderate medium subangular blocky; hard, friable; few very fine roots throughout; common fine tubular pores; common discontinuous pressure faces on vertical faces of peds; many fine and medium irregular soft masses of iron-manganese; slightly acid; gradual smooth boundary.

C—60 to 80 inches; grayish brown (2.5Y 5/2) silt loam, light gray (2.5Y 7/2) dry; many fine prominent strong brown (7.5YR 5/8) and common medium strong brown (7.5YR 5/6) iron masses in the soil matrix; the iron accumulations are relict redoximorphic features; massive; hard, friable; common fine tubular pores; discontinuous pressure faces on vertical faces of peds; many fine and medium irregular soft masses of iron-manganese; neutral.

Range in Characteristics

Soil moisture regime: Udic
Depth to argillic horizon: 6 to 20 inches
Depth to redoximorphic concentrations: 12 to 36 inches; the mottling pattern is a relict feature and is not considered indicative of present drainage conditions.
Thickness of the mollic epipedon: 10 to 24 inches (extends into the upper part of the Bt horizon)
Thickness of the solum: 30 to 72 inches
Reaction: Moderately acid or strongly acid in the most acid part of the solum.

Particle-size control section (weighted average): Silty clay loam
Content of clay in the particle-size control section (weighted average): 35 to 42 percent

A horizon:
Hue—10YR
Value—2 or 3 moist, 3 or 4 dry
Chroma—1 or 2 (moist or dry)
Texture—silty clay loam
Content of clay—27 to 35 percent
Reaction—slightly acid to strongly acid
Thickness of the horizon—6 to 20 inches

Bt horizon:
Hue—10YR (upper part); 10YR or 2.5Y (lower part)
Value—3 or 4 moist, 4 or 5 dry (upper part); 4 to 6 moist, 5 to 7 dry (lower part)
Chroma—2 or 3 (upper part); 2 to 4 (lower part) (moist or dry for both)
Redoximorphic concentrations—hue of 10YR or 7.5YR, chroma of 4 or 5, and value of 4 to 6
Texture—silty clay loam or silty clay
Content of clay—35 to 42 percent
Reaction—slightly acid to strongly acid
Thickness of the horizon—18 to 48 inches
Special features—redoximorphic concentrations that are considered relict

BC horizon:
Hue—10YR or 2.5Y
Value—4 to 6 moist, 5 to 7 dry
Chroma—2 to 4 (moist or dry)
Redoximorphic concentrations—hue of 10YR or 7.5YR, chroma of 4 or 5, and value of 4 to 6
Texture—silty clay loam
Content of clay—27 to 35 percent
Reaction—slightly acid to moderately acid
Thickness of the horizon—6 to 20 inches
Special features—redoximophic concentrations that are considered relict

C horizon:
Hue—10YR or 2.5Y
Value—4 to 6 moist, 5 to 7 dry
Chroma—2 to 4 (moist or dry)
Redoximorphic concentrations—hue of 10YR or 7.5YR, chroma of 4 or 5, and value of 4 to 6
Texture—silty clay loam or silt loam
Content of clay—24 to 35 percent
Reaction—neutral or slightly acid
Special features—redoximophic concentrations that are considered relict

Alda Series

The Alda series consists of very deep, somewhat poorly drained soils that formed in 20 to 40 inches of stratified loamy alluvium over coarse sand or gravelly sand. These soils are on flood plains. They are moderately deep over coarse sand or gravelly sand. Permeability is moderately rapid in the upper part and very rapid in the lower part. Slopes range from 0 to 3 percent. The mean annual temperature is 51 degrees F, and the mean annual precipitation is 25 inches.

Taxonomic classification: Coarse-loamy, mixed, superactive, mesic Oxyaquic Haplustolls

Typical Pedon

Alda fine sandy loam, in a cultivated field, about 12 miles north and 2 miles east of Shelby, Nebraska, in Polk County, Nebraska; 1,600 feet north and 25 feet east of the southwest corner of sec. 12, T. 16 N., R. 1 W.; Columbus S. USGS topographic quadrangle; lat. 41 degrees 22 minutes 14 seconds N. and long. 97 degrees 23 minutes 13 seconds W. When this pedon was described, the water table was at a depth of 60 inches. (Colors are for dry soil unless otherwise indicated.)

Ap—0 to 8 inches; dark gray (10YR 4/1) fine sandy loam, very dark gray (10YR 3/1) moist; weak fine granular structure; soft, friable; many medium roots; neutral; abrupt smooth boundary.
A—8 to 11 inches; dark gray (10YR 4/1) fine sandy loam, very dark gray (10YR 3/1) moist; weak medium subangular blocky structure parting to weak fine granular; soft, very friable; common fine roots; neutral; clear wavy boundary.
AC—11 to 17 inches; grayish brown (10YR 5/2) fine sandy loam, very dark grayish brown (10YR 3/2) moist; weak medium subangular blocky structure; soft, very friable; common fine roots; strong effervescence; moderately alkaline; clear wavy boundary.
C—17 to 29 inches; light brownish gray (10YR 6/2) fine sandy loam, dark grayish brown (10YR 4/2) moist; common fine distinct dark yellowish brown (10YR 4/4) iron stains in the matrix; weak fine subangular blocky structure; soft, very friable; few fine roots; strata of fine sand and coarse sand; strong effervescence; moderately alkaline; clear wavy boundary.
2Cg1—29 to 34 inches; light gray (10YR 7/2) coarse sand, light brownish gray (10YR 6/2) moist; single

grain; loose; slightly alkaline; gradual wavy boundary.

2Cg2—34 to 80 inches; light brownish gray (10YR 6/2) coarse sand and gravelly sand, grayish brown (10YR 5/2) moist; common medium prominent dark reddish brown (5YR 2/2) iron masses in the soil matrix; single grain; loose; neutral.

Range in Characteristics

Soil moisture: The soil is moist in the solum from December through April and intermittently moist from May through December. July through September, the driest period, is within the intermittently moist period from May through December.
Depth to secondary carbonates: 0 to 36 inches
Redoximorphic features: Distinct or prominent olive brown to brown (2.5Y to 7.5YR) masses of iron-manganese starting at a depth of 18 to 36 inches in most pedons
Depth to endosaturation: 18 to 54 inches; somewhat poorly drained or moderately well drained
Thickness of the mollic epipedon: 7 to 20 inches
Thickness of the solum: 10 to 28 inches
Content of clay in the particle-size control section (weighted average): 2 to 12 percent
Content of silt in the particle-size control section (weighted average): 15 to 27 percent
Content of sand in the particle-size control section (weighted average): 60 to 75 percent

A horizon:
Hue—10YR
Value—4 or 5 dry, 2 or 3 moist
Chroma—1 or 2
Texture—typically loam, fine sandy loam, sandy loam, silt loam, or very fine sandy loam; strata of finer and coarser material in some pedons
Content of clay—2 to 27 percent
Content of rock fragments—0 to 2 percent rounded gravel, by volume (2 to 75 mm in diameter)
Electrical conductivity (mmhos/cm)—0 to 4 (near the surface)
Reaction—neutral to moderately alkaline

C horizon:
Hue—7.5YR, 10YR, or 2.5Y
Value—4 to 8 dry, 3 to 6 moist
Chroma—1 to 3
Texture—sandy loam, fine sandy loam, very fine sandy loam, sand, fine sand, or loamy fine sand; stratifed textures are common in some pedons near natural drainageways
Content of clay—2 to 27 percent
Content of rock fragments—2 to 15 percent rounded gravel, by volume (2 to 75 mm in diameter), at depths between 20 and 40 inches
Reaction—slightly alkaline to moderately alkaline

2Cg horizon:
Hue—7.5YR, 10YR, or 2.5Y
Value—4 to 8 dry, 3 to 6 moist
Chroma—1 to 3
Texture—coarse sand, gravelly sand, or gravelly coarse sand
Content of clay—2 to 10 percent
Content of rock fragments—3 to 35 percent rounded gravel, by volume (2 to 75 mm in diameter)
Reaction—neutral to moderately alkaline

Barney Series

The Barney series consists of very deep, poorly drained and very poorly drained soils that formed in stratified loamy material deposited over sandy and gravelly alluvium. These soils are on flood plains along major streams. Permeability is rapid or very rapid below the loamy material. Slopes range from 0 to 2 percent. The mean annual temperature is about 51 degrees F, and the mean annual precipitation is about 23 inches.

Taxonomic classification: Sandy, mixed, mesic Mollic Fluvaquents

Typical Pedon

Barney loam, on a slope of 0.5 percent, in an area of rangeland, about 2 miles south and 2 miles west of Verdigre, in Knox County, Nebraska; 500 feet south and 100 feet west of the northeast corner of sec. 24, T. 30 N., R. 7 W.; Verdigre USGS topographic quadrangle; lat. 42 degrees 34 minutes 02 seconds N. and long. 98 degrees 04 minutes 18 seconds W. When described, the soil was moist throughout. (Colors are for dry soil unless otherwise indicated.)

A—0 to 7 inches; gray (10YR 5/1) loam, very dark gray (10YR 3/1) moist; common fine distinct strong brown (7.5YR 5/6) (moist) iron accumulations in the matrix; weak thin platy structure; slightly hard, friable; few thin strata of fine sandy loam and loamy fine sand; strong effervescence; moderately alkaline; clear smooth boundary.

ACg—7 to 10 inches; gray (10YR 6/1) loam, dark gray (10YR 4/1) moist; common fine prominent strong

brown (7.5YR 5/6) (moist) iron accumulations in the matrix; weak thin platy structure; slightly hard, friable; few thin strata of fine sandy loam and loamy fine sand; common fine and very fine roots; strong effervescence; moderately alkaline; clear smooth boundary.

Cg1—10 to 30 inches; light gray (10YR 7/2) fine sand, light brownish gray (10YR 6/2) moist; few fine prominent strong brown (7.5YR 5/6) (moist) iron accumulations in the matrix; single grain; loose; few very fine roots in the upper part; few thin strata of silt loam; moderately alkaline; clear smooth boundary.

Cg2—30 to 80 inches; light gray (10YR 7/2) coarse sand, light brownish gray (10YR 6/2) moist; single grain; loose; 5 percent gravel, by volume; moderately alkaline.

Range in Characteristics

Soil moisture regime: Aquic; the soil is generally saturated to or near the surface during most of the growing season.

Depth to secondary carbonates: 0 to 15 inches (some pedons do not have free carbonates)

Redoximorphic features: Common fine distinct and prominent brownish to yellowish brown iron masses near the surface to a depth of 80 inches

Depth to endosaturation: 18 inches (poorly drained phase); 6 to 12 inches (very poorly drained phase)

Thickness of the mollic epipedon: 6 to 9 inches

Content of clay in the particle-size control section (weighted average): 3 to 10 percent

Content of sand in the particle-size control section (weighted average): 70 to 97 percent

Content of rock fragments in the particle-size control section (weighted average): 0 to 25 percent; below a depth of 10 inches

A horizon:

Hue—10YR or 2.5Y
Value—3 to 5 dry, 2 or 3 moist
Chroma—1 or 2
Texture—silty clay loam, silt loam, loam, fine sandy loam, sandy loam, loamy fine sand, fine sand, or sand; commonly stratified
Content of clay—5 to 35 percent
Reaction—neutral to moderately alkaline

ACg horizon:

Hue—10YR or 2.5Y
Value—4 to 6 dry, 3 to 5 moist
Chroma—1 or 2
Texture—silty clay loam, silt loam, loam, fine sandy loam, sandy loam, loamy fine sand, fine sand, or sand
Content of clay—5 to 35 percent
Content of rock fragments—0 to 10 percent rounded gravel, by volume (2 to 75 mm in diameter)
Reaction—neutral to moderately alkaline

Cg1 horizon:

Hue—10YR or 2.5Y
Value—5 to 7 dry, 4 to 6 moist
Chroma—1 to 3
Texture—loamy fine sand, loamy sand, fine sand, or sand; 1- to 5-inch strata of loamy material; stratified loam, very fine sandy loam, fine sandy loam, or sandy loam in the upper few inches in some pedons
Content of clay—3 to 10 percent
Content of rock fragments—0 to 15 percent rounded gravel, by volume (2 to 75 mm in diameter)
Reaction—neutral to moderately alkaline

Cg2 horizon:

Hue—10YR or 2.5Y
Value—5 to 8 dry, 4 to 7 moist
Chroma—1 to 3
Texture—coarse sand, sand, gravelly coarse sand, or fine sand
Content of clay—0 to 5 percent
Content of rock fragments—0 to 25 percent rounded gravel, by volume (2 to 75 mm in diameter)
Reaction—neutral or slightly alkaline

Boel Series

The Boel series consists of very deep, somewhat poorly drained soils that formed in recent loamy and sandy alluvium. These soils are on flood plains. Permeability is moderate to rapid. Slopes range from 0 to 3 percent. The mean annual precipitation is about 25 inches, and the mean annual temperature is about 52 degrees F near the type location.

Taxonomic classification: Sandy, mixed, mesic Fluvaquentic Haplustolls

Typical Pedon

Boel fine sandy loam, on a slope of 1 percent, in an area of rangeland, about 3 miles east and 0.5 mile north of Dannebrog, in Howard County, Nebraska; 200 feet east and 2,100 feet north of the southwest corner of sec. 4, T. 13 N., R. 10 W.; St. Paul USGS

topographic quadrangle; lat. 41 degrees 07 minutes 32 seconds N. and long. 98 degrees 28 minutes 40 seconds W. (Colors are for dry soil unless otherwise indicated.)

A—0 to 8 inches; dark gray (10YR 4/1) fine sandy loam, very dark brown (10YR 2/2) moist; weak very fine granular structure; soft, very friable; many fine and medium roots throughout; many fine tubular pores; moderately alkaline; slight effervescence; clear smooth boundary.

AC—8 to 11 inches; grayish brown (10YR 5/2) fine sandy loam, very dark grayish brown (10YR 3/2) moist; weak fine granular structure; soft, very friable; many fine and medium roots throughout; many fine tubular pores; few thin strata of loam; moderately alkaline; slight effervescence; clear wavy boundary.

C—11 to 45 inches; white (10YR 8/2) fine sand, light brownish gray (10YR 6/2) moist; few medium distinct reddish brown (10YR 4/4) iron masses in the soil matrix; single grain; loose; few fine and medium roots throughout; few fine tubular pores; moderately alkaline; clear wavy boundary.

Cg—45 to 80 inches; light gray (2.5Y 7/2) fine sand, light brownish gray (2.5Y 6/2) moist; few fine prominent dark reddish brown (5YR 3/3) iron masses in the soil matrix; single grain; loose; few fine and medium roots throughout; few fine tubular pores; moderately alkaline.

Range in Characteristics

Soil moisture: The soil is moist in the solum from December through April and intermittently moist from May through December. July through September, the driest period, is within the intermittently moist period from May through December.

Mean annual soil temperature: 46 to 51 degrees F

Depth to redoximorphic concentrations: 10 to 24 inches

Depth to episaturation: 18 to 36 inches from November through May

Thickness of the mollic epipedon: 10 to 20 inches

Thickness of the solum: 10 to 20 inches

Content of clay in the particle-size control section (weighted average): 0 to 12 percent

Content of sand in the particle-size control section (weighted average): 75 to 100 percent

Other features: Free carbonates are typically in the A horizon and are not present in some of the lower horizons; some profiles contain free carbonates throughout; strata of silt loam to loamy sand are common in the solum; a silty clay loam overwash phase is recognized.

A horizon:
Hue—10YR
Value—3 to 5 dry, 2 or 3 moist
Chroma—1 or 2
Texture—fine sandy loam, sandy loam, loam, silt loam, very fine sandy loam, loamy sand, or loamy fine sand
Content of clay—2 to 25 percent
Content of sand—20 to 90 percent
Reaction—slightly acid to moderately alkaline

AC horizon:
Hue—10YR
Value—3 to 5 dry, 2 to 4 moist
Chroma—1 or 2
Texture—fine sandy loam, sandy loam, loamy fine sand, or loamy sand
Content of clay—2 to 20 percent
Content of sand—43 to 90 percent
Reaction—neutral to moderately alkaline

C and Cg horizons:
Hue—10YR or 2.5Y
Value—6 to 8 dry, 5 to 7 moist
Chroma—1 or 2
Texture—fine sand, loamy fine sand, sand, or coarse sand; these horizons are typically stratified with lenses of lighter and darker material (may also be coarser.or finer textured)
Content of clay—0 to 6 percent
Content of sand—70 to 100 percent
Reaction—neutral to moderately alkaline

Burchard Series

The Burchard series consists of very deep, well drained soils that formed in calcareous glacial till. These soils are on uplands. Permeability is moderately slow. Slopes range from 2 to 30 percent. The mean annual precipitation is about 30 inches, and the mean annual temperature is about 54 degrees F at the type location.

Taxonomic classification: Fine-loamy, mixed, superactive, mesic Typic Argiudolls

Typical Pedon

Burchard clay loam, on a slope of 8 percent, in an area of native rangeland about 1 mile north and 2 miles east of Burchard, in Pawnee County, Nebraska;

400 feet west and 400 feet north of the southeast corner of sec. 5, T. 2 N., R. 10 E.; Burchard USGS topographic quadrangle; lat. 40 degrees 09 minutes 43 seconds N. and long. 96 degrees 18 minutes 50 seconds W. (Colors are for moist soil unless otherwise indicated.)

A—0 to 13 inches; black (10YR 2/1) clay loam, dark gray (10YR 4/1) dry; moderate medium and fine granular structure; slightly hard, friable; many very fine and fine and few medium and coarse roots throughout; slightly acid; gradual wavy boundary.

Bt—13 to 19 inches; 60 percent dark brown (10YR 4/3) and 40 percent mixing of dark grayish brown (10YR 4/2) clay loam, brown (10YR 5/3) and grayish brown (10YR 5/2) dry; moderate fine and very fine subangular blocky structure; hard, friable; thin discontinuous clay films on faces of peds; neutral; clear wavy boundary.

Btk—19 to 29 inches; olive brown (2.5Y 4/4) clay loam, light yellowish brown (2.5Y 6/4) dry; moderate fine subangular blocky structure; hard, friable; common fine and medium roots throughout; thin discontinuous clay films on faces of peds; soft accumulations of segregated lime; slight effervescence; moderately alkaline; gradual wavy boundary.

Bk—29 to 37 inches; light brownish gray (2.5Y 6/2) and dark yellowish brown (10YR 4/4) clay loam, light gray (2.5Y 7/2) and yellowish brown (10YR 5/4) dry; moderate medium angular blocky structure; hard, friable; few very fine, fine, and medium roots in cracks; many medium and coarse soft accumulations of segregated lime; slight effervescence; moderately alkaline; gradual wavy boundary.

C—37 to 60 inches; light brownish gray (2.5Y 6/2) clay loam, light gray (2.5Y 7/2) dry; weak coarse and medium angular blocky structure; hard, firm; many fine seams and pockets of soft lime; 5 percent gravel, by volume; strong effervescence; many coarse distinct yellowish brown (10YR 5/4) soft masses of iron accumulation; moderately alkaline.

Range in Characteristics

Soil moisture regime: Udic
Mean annual soil temperature: 51 to 56 degrees F
Depth to argillic horizon: 8 to 18 inches
Depth to secondary calcium carbonate: 12 to 30 inches
Depth to redoximorphic concentrations: 22 to 80 inches, if present
Thickness of the solum: 24 to 80 inches
Content of clay in the particle-size control section (weighted average): 27 to 35 percent
Content of sand in the particle-size control section (weighted average): 20 to 45 percent fine and coarser sand
Content of rock fragments in the particle-size control section (weighted average): 1 to 10 percent gravel, by volume

A horizon:
Hue—10YR
Value—3 to 5 dry, 2 or 3 moist
Chroma—1 or 2
Texture—loam, silt loam, or clay loam
Content of clay—18 to 30 percent
Reaction—moderately acid to neutral

Bt horizon:
Hue—10YR
Value—4 to 7 dry, 3 to 6 moist
Chroma—2 or 6
Texture—clay loam
Content of clay—27 to 35 percent; as much as 38 percent in some pedons
Reaction—slightly acid or neutral

Btk horizon:
Hue—10YR or 2.5Y
Value—4 to 7 dry, 3 to 6 moist
Chroma—2 to 6
Texture—loam or clay loam
Content of clay—18 to 30 percent
Calcium carbonate equivalent—5 to 10 percent
Reaction—slightly alkaline or moderately alkaline

Bk horizon (if it occurs):
Hue—10YR or 2.5Y
Value—4 to 7 dry, 3 to 6 moist
Chroma—2 to 6
Texture—loam or clay loam
Content of clay—18 to 30 percent
Calcium carbonate equivalent—5 to 10 percent
Reaction—slightly alkaline or moderately alkaline

C horizon:
Hue—10YR or 2.5Y
Value—6 or 7, moist or dry
Chroma—2 or 3
Texture—loam or clay loam
Content of clay—25 to 35 percent
Calcium carbonate equivalent—10 to 15 percent
Content of gypsum—0 to 2 percent
Reaction—slightly alkaline or moderately alkaline

Deroin Series

The Deroin series consists of very deep, well drained soils that formed in reddish silty material presumed to be Loveland loess. These soils are on uplands. Slopes range from 2 to 17 percent. The mean annual precipitation is about 34 inches, and the mean annual air temperature is about 53 degrees F at the type location.

Taxonomic classification: Fine-silty, mixed, superactive, mesic Mollic Hapludalfs

Typical Pedon

Deroin silty clay loam, on a convex, east-facing side slope of 7 percent, in an area of cropland, about 8 miles north and 5 miles west of Falls City, in Richardson County, Nebraska; 100 feet south and 1,050 feet east of the northwest corner of sec. 35, T. 3 N., R. 15 E.; Verdon USGS topographic quadrangle; lat. 40 degrees 11 minutes 20 seconds N. and long. 95 degrees 42 minutes 19 seconds W. (Colors are for moist soil unless otherwise indicated.)

Ap—0 to 7 inches; dark brown (7.5YR 3/2) silty clay loam, brown (10YR 5/3) dry; weak fine and medium granular structure; slightly hard, friable; few fine roots throughout; few fine tubular pores; moderately acid; abrupt smooth boundary.

Bt1—7 to 12 inches; reddish brown (5YR 4/3) silty clay loam, brown (7.5YR 5/4) dry; weak fine and medium prismatic structure parting to weak fine subangular blocky; slightly hard, friable; few fine roots throughout; few fine tubular pores; faint discontinuous clay films on faces of peds; few fine irregular iron-manganese concretions; slightly acid; gradual smooth boundary.

Bt2—12 to 18 inches; reddish brown (5YR 4/4) silty clay loam, brown (7.5YR 5/4) dry; weak coarse subangular blocky structure parting to weak fine and medium subangular blocky; slightly hard, friable; few fine roots throughout; few fine tubular pores; distinct discontinuous clay films on faces of peds; few fine irregular iron-manganese concretions; neutral; gradual smooth boundary.

Bt3—18 to 40 inches; reddish brown (5YR 4/4) silty clay loam, brown (7.5YR 5/4) dry; weak coarse prismatic structure parting to weak coarse subangular blocky; slightly hard, friable; few fine tubular pores; distinct discontinuous clay films on faces of peds; few fine irregular iron-manganese concretions; slightly acid; gradual smooth boundary.

BC—40 to 50 inches; reddish brown (5YR 4/4) silty clay loam, reddish brown (5YR 5/4) dry; weak fine and medium subangular blocky structure; slightly hard, friable; few fine irregular iron-manganese concretions; slightly acid; gradual smooth boundary.

C—50 to 80 inches; reddish brown (5YR 4/4) silty clay loam, reddish brown (5YR 5/4) dry; massive; slightly hard, friable; few fine irregular iron-manganese concretions; slightly acid; few fine sand grains throughout.

Range in Characteristics

Soil moisture regime: Udic
Mean annual soil temperature: 53 to 56 degrees F
Depth to argillic horizon: 4 to 9 inches
Depth to secondary calcium carbonate: Commonly more than 60 inches but some pedons contain carbonates between depths of 30 to 60 inches
Thickness of mollic colors: Between depths of 4 to 9 inches
Content of clay in the particle-size control section (weighted average): 27 to 35 percent
Content of sand in the particle-size control section (weighted average): 5 to 30 percent

A horizon:
Hue—7.5YR or 10YR
Value—2 or 3 moist, 3 to 5 dry
Chroma—2 or 3
Texture—silty clay loam or clay loam
Content of clay—27 to 35 percent
Reaction—moderately acid or slightly acid

Bt horizon:
Hue—7.5YR or 5YR
Value—3 to 5 moist, 4 to 6 dry
Chroma—3 to 6
Texture—silty clay loam or clay loam
Content of clay—27 to 35 percent
Content of sand—5 to 30 percent
Reaction—slightly acid to slightly alkaline

BC horizon:
Hue—7.5YR or 5YR
Value—4 or 5 moist, 5 to 7 dry
Chroma—3 to 6
Texture—silty clay loam or clay loam
Content of clay—27 to 35 percent
Content of sand—5 to 25 percent very fine sand
Reaction—slightly acid to slightly alkaline

C horizon:
Hue—7.5YR or 5YR
Value—4 or 5 moist, 5 to 7 dry

Chroma—3 to 6
Texture—silty clay loam, clay loam, loam, or silt loam
Content of clay—24 to 32 percent
Content of sand—5 to 25 percent very fine sand
Reaction—slightly acid to slightly alkaline

Filbert Series

The Filbert series consists of very deep, somewhat poorly drained soils that formed in loess. These soils are in open depressions on stream terraces. Permeability is very slow. Slopes are 0 to 1 percent. The mean annual precipitation is about 28 inches, and the mean annual temperature is about 51 degrees F at the type location.

Taxonomic classification: Fine, smectitic, mesic Vertic Argialbolls

Typical Pedon

Filbert silt loam, on a concave slope of less than 1 percent, in an area of cropland about 2 miles east and 4 miles north of Wahoo, in Saunders County, Nebraska; 1,875 feet west and 350 feet north of the southeast corner of sec. 13, T. 15 N., R. 7 E.; lat. 41 degrees 14 minutes 52 seconds N. and long. 96 degrees 34 minutes 12 seconds W. (Colors are for moist soil unless otherwise indicated.)

Ap1—0 to 5 inches; black (10YR 2/1) silt loam, dark gray (10YR 4/1) dry; weak fine granular structure; very friable, slightly hard; common coarse and medium and fine roots throughout; strongly acid; abrupt smooth boundary.

Ap2—5 to 7 inches; black (10YR 2/1) silt loam, dark gray (10YR 4/1) dry; weak thick platy and weak thin platy structure parting to weak fine granular; friable, slightly hard; common fine and medium roots throughout; very strongly acid; abrupt smooth boundary.

E1—7 to 12 inches; very dark gray (10YR 3/1) silt loam, 50 percent gray (10YR 5/1) and 50 percent gray (10YR 6/1) dry; moderate thin platy structure parting to weak thin platy; friable, soft; common fine and medium roots throughout; common fine tubular pores; few fine distinct dark yellowish brown (10YR 4/6) friable masses of iron accumulations with sharp boundaries on faces of peds; strongly acid; clear wavy boundary.

E2—12 to 15 inches; dark gray (10YR 4/1) silt loam, 20 percent gray (10YR 6/1) and 80 percent light gray (10YR 7/1) dry; weak thin platy structure parting to weak fine subangular blocky; friable, slightly hard; common fine and medium roots throughout; many fine tubular pores; slightly acid; abrupt wavy boundary.

Bt1—15 to 25 inches; very dark gray (10YR 3/1) silty clay, dark gray (10YR 4/1) dry; strong coarse prismatic structure parting to strong medium angular blocky; very firm, very hard; common fine roots between peds; many distinct continuous clay films on faces of peds; many fine rounded soft masses of iron-manganese and common fine rounded iron-manganese concretions; neutral; gradual wavy boundary.

Bt2—25 to 36 inches; very dark gray (10YR 3/1) silty clay, dark gray (10YR 4/1) dry; strong coarse prismatic structure parting to strong medium angular blocky; very firm, very hard; few fine roots between peds; many distinct continuous clay films on faces of peds; many fine rounded soft masses of iron-manganese and common fine rounded iron-manganese concretions; neutral; gradual wavy boundary.

Bt3—36 to 43 inches; very dark gray (10YR 3/1) silty clay, grayish brown (2.5Y 5/2) dry; strong coarse prismatic structure parting to strong medium angular blocky; very firm, very hard; few very fine roots between peds; many distinct continuous clay films on faces of peds; many fine rounded soft masses of iron-manganese and fine rounded iron-manganese concretions; slightly alkaline; gradual wavy boundary.

Bt4—43 to 53 inches; very dark grayish brown (10YR 3/2) silty clay, grayish brown (2.5Y 5/2) dry; strong coarse prismatic structure parting to strong medium angular blocky; very firm, very hard; few very fine roots between peds; many distinct continuous clay films on faces of peds; common fine rounded soft masses of iron-manganese; slightly alkaline; gradual wavy boundary.

Bt5—53 to 62 inches; very dark grayish brown (10YR 3/2) silty clay, grayish brown (2.5Y 5/2) dry; strong coarse prismatic structure parting to strong medium angular blocky; very firm, very hard; many distinct continuous clay films on faces of peds; common fine rounded soft masses of iron-manganese; few medium distinct grayish brown (2.5Y 5/2) iron depletions on surfaces of peds; slightly alkaline; gradual wavy boundary.

Bt6—62 to 80 inches; 15 percent very dark grayish brown (2.5Y 3/2), and 85 percent olive gray (5Y 5/2) and dark gray (5Y 4/1) silty clay loam, light brownish gray (2.5Y 6/2) dry; moderate coarse prismatic structure parting to strong medium

subangular blocky; very firm, very hard; many distinct continuous clay films on faces of peds and few distinct continuous black stains in root channels and/or pores; fine irregular soft masses of iron-manganese; few fine prominent dark yellowish brown (10YR 4/6) friable masses of iron accumulation with sharp boundaries on faces of peds; slightly alkaline.

Range in Characteristics

Soil moisture regime: Udic; the soil moisture control section is dry in all parts for 80 out of the 120 days following the summer solstice in 2 years out of 10.
Depth to base of the argillic horizon: 60 to more than 80 inches
Thickness of the solum: 60 to more than 80 inches
Thickness of the mollic epipedon: 6 to 14 inches (extends into the B horizon)
Particle-size control section (weighted average): Silty clay
Content of clay in the particle-size control section (weighted average): 45 to 55 percent
Content of sand in the particle-size control section (weighted average): Less than 10 percent

A horizon:
Hue—10YR
Value—2 or 3 moist, 4 or 5 dry
Chroma—1 or 2
Texture—silt loam or silty clay loam
Content of clay—18 to 27 percent
Reaction—moderately acid to very strongly acid
Thickness of the horizon—6 to 14 inches

E horizon:
Hue—10YR
Value—3 to 5 moist, 5 to 7 dry
Chroma—1
Texture—silt loam
Content of clay—14 to 20 percent
Reaction—slightly acid to strongly acid
Thickness of the horizon—3 to 12 inches
Special feature—platy or granular structure

Bt horizon:
Hue—10YR, 2.5Y, or N
Value—2 to 4 moist, 3 to 6 dry
Chroma—0 to 2
Texture—silty clay or clay (upper part); silty clay loam or silty clay (lower part)
Content of clay—45 to 55 percent (upper part); 35 to 45 percent (lower part)
Reaction—slightly acid to slightly alkaline
Thickness of the horizon—40 to 80 inches

BC horizon:
Hue—10YR or 2.5Y
Value—3 to 6 moist, 5 to 8 dry
Chroma—1 to 3
Texture—silty clay loam or silt loam
Content of clay—18 to 35 percent
Reaction—neutral to moderately alkaline
Thickness of the horizon—5 to 18 inches

C horizon:
Hue—10YR or 2.5Y
Value—4 to 7 moist, 5 to 8 dry
Chroma—2 to 4
Texture—silt loam or silty clay loam
Content of clay—18 to 35 percent
Reaction—neutral to moderately alkaline

Fillmore Series

The Fillmore series consists of very deep, somewhat poorly drained soils that formed in loess. These soils are in depressions on uplands and stream terraces. Permeability is very slow. Slopes range from 0 to 2 percent. The mean annual precipitation is about 23 inches, and the mean annual temperature is about 52 degrees F at the type location.

Taxonomic classification: Fine, smectitic, mesic Vertic Argialbolls

Typical Pedon

Fillmore silt loam, on a concave slope of less than 1 percent, in native rangeland about 2 miles south of Clay Center, in Clay County, Nebraska; 2,390 feet west and 275 feet north of the southeast corner of sec. 12, T. 6 N., R. 7 W. (Colors are for dry soil unless otherwise indicated.)

A—0 to 9 inches; gray (10YR 5/1) silt loam, very dark gray (10YR 3/1) moist; weak medium subangular blocky structure parting to weak medium granular; slightly hard, friable; slightly acid; abrupt smooth boundary.
E—9 to 13 inches; light gray (10YR 6/1) silt loam, gray (10YR 5/1) moist; weak medium platy structure parting to weak fine granular; soft, friable; slightly acid; few hard ferro-manganese pellets 1 to 2 mm in diameter; abrupt smooth boundary.
Bt1—13 to 24 inches; gray (10YR 5/1) silty clay, very dark gray (10YR 3/1) moist; strong coarse and medium angular blocky structure; very hard, very firm; shiny faces on most peds; many hard ferro-manganese pellets 1 to 2 mm in diameter; neutral; clear smooth boundary.

Bt2—24 to 32 inches; grayish brown (10YR 5/2) silty clay, very dark grayish brown (10YR 3/2) moist; strong coarse and medium angular blocky structure; very hard, very firm; shiny faces on most peds; slightly alkaline; clear smooth boundary.

BC—32 to 44 inches; grayish brown (10YR 5/2) silty clay loam, very dark grayish brown (10YR 3/2) moist; moderate coarse and medium subangular blocky structure; hard, firm; slightly alkaline; gradual smooth boundary.

C—44 to 60 inches; grayish brown (2.5Y 5/2) silty clay loam, dark grayish brown (2.5Y 4/2) moist; weak coarse prismatic structure parting to weak medium subangular blocky; slightly hard, friable; slight effervescence; moderately alkaline.

Range in Characteristics

Soil moisture: The soil is saturated to the surface from November through March. It is intermittently dry in the surface layer but generally contains water at near saturation in the perched zone within the lower soil horizons from April through July. It is driest from August through October.

Depth to secondary carbonates: 30 to more than 60 inches; the C horizon in some pedons has calcium carbonates that form concretions or mycelia-like filaments and castings on cleavage planes.

Redoximorphic features: Indicators are generally present in the soil but are masked by the very dark color of the organic matter. Common fine distinct (10YR 4/4) oxidized zones exist around root channels in the upper part of the Bt horizon. Few or common fine to coarse black (10YR 2/1) round (shot-like), hard, iron-manganese concretions or nodules are also present in the Bt horizon. Grayish depletions occur within the matrix of peds and may be visible in the lower part of the B horizon directly below the dark organic colors.

Depth to episaturation: 6 inches above the surface to about 24 inches below the surface

Thickness of the mollic epipedon: Averages about 32 inches; may extend to the base of the B horizon

Thickness of the solum: 30 to more than 60 inches

A horizon:
Hue—10YR
Value—4 or 5 dry, 2 or 3 moist
Chroma—1 or 2
Texture—silt loam or silty clay loam
Reaction—strongly acid to slightly acid

E horizon:
Hue—10YR
Value—5 to 7 dry, 4 or 5 moist
Chroma—1
Texture—silt loam
Reaction—strongly acid to slightly acid
Special features—this horizon has generally been destroyed by tillage in farmed areas; material from the A and Bt horizons may be mixed with this horizon

Bt horizon:
Hue—10YR, 5Y, 2.5Y, or N
Value—3 to 6 dry, 2 to 5 moist
Chroma—0 to 2
Texture—silty clay or clay
Content of clay—dominantly 45 to 55 percent; ranges from 40 to 55 percent
Reaction—moderately acid to slightly alkaline

BC horizon:
Hue—10YR or 2.5Y
Value—4 to 6 dry, 2 to 5 moist
Chroma—1 to 3
Texture—silty clay loam
Reaction—neutral to moderately alkaline

C horizon:
Hue—10YR or 2.5Y
Value—5 to 7 dry, 4 to 6 moist
Chroma—2 to 4
Texture—silt loam or silty clay loam
Reaction—neutral to moderately alkaline

Gibbon Series

The Gibbon series consists of very deep, somewhat poorly drained soils that formed in stratified, calcareous alluvium. These soils are on flood plains. Permeability is moderate or moderately slow. Slopes range from 0 to 2 percent. The mean annual temperature is 53 degrees F, and the mean annual precipitation is 23 inches at the type location.

Taxonomic classification: Fine-silty, mixed, superactive, calcareous, mesic Fluvaquentic Endoaquolls

Typical Pedon

Gibbon silty clay loam, on a slope of less than 1 percent, in a cultivated field about 1 mile south and 1.5 miles west of Inavale, in Webster County, Nebraska; 3,060 feet east and 70 feet south of the northwest corner of sec. 9, T. 1 N., R. 12 W. (Colors are for dry soil unless otherwise indicated.)

Ap—0 to 5 inches; dark gray (10YR 4/1) silty clay loam, very dark gray (10YR 3/1) moist; moderate very fine granular structure; slightly hard, friable;

strong effervescence; moderately alkaline; abrupt smooth boundary.

A—5 to 11 inches; very dark gray (10YR 3/1) silty clay loam, black (10YR 2/1) moist; moderate very fine granular structure; slightly hard, friable; strong effervescence; moderately alkaline; clear smooth boundary.

AC—11 to 18 inches; light gray (10YR 6/1) silty clay loam, dark gray (10YR 4/1) moist; moderate very fine granular structure; slightly hard, friable; few fine faint brownish and yellowish iron masses in the matrix; violent effervescence; moderately alkaline; clear smooth boundary.

Cg1—18 to 26 inches; light brownish gray (10YR 6/2) silt loam, dark gray (10YR 4/1) moist; massive; soft, very friable; common medium distinct grayish, brownish, and yellowish iron masses in the matrix; violent effervescence; moderately alkaline; clear smooth boundary.

Cg2—26 to 36 inches; light gray (10YR 7/2) very fine sandy loam, light brownish gray (10YR 6/2) moist; massive; soft, very friable; common coarse prominent brownish iron masses in the matrix; strong effervescence; strongly alkaline; clear smooth boundary.

Cg3—36 to 80 inches; light gray (10YR 7/2) fine sandy loam, grayish brown (10YR 5/2) moist; massive; soft, very friable; common coarse prominent brownish iron masses in the matrix; strong effervescence; strongly alkaline.

Range in Characteristics

Soil moisture: The soil is moist in the solum from December through April and intermittently moist from May through December. July through September, the driest period, is within the intermittently moist period from May through December.

Mean annual soil temperature: 48 to 52 degrees F

Depth to carbonates: Less than 10 inches

Calcium carbonate equivalent: 5 to 15 percent

Depth to redoximorphic concentrations: 10 to 20 inches

Depth to episaturation: 12 to 36 inches from November through June

Thickness of the mollic epipedon: 10 to 20 inches

Thickness of the solum: 33 to 50 inches

Other features: Carbonate concretions are in the AC and C horizons in some pedons.

A horizon:

Hue—10YR or 2.5Y
Value—3 to 5 dry, 2 or 3 moist
Chroma—1 or 2
Texture—silt loam, silty clay loam, very fine sandy loam, loam, or clay loam
Content of clay—8 to 35 percent
Content of sand—5 to 85 percent
Reaction—slightly alkaline or moderately alkaline

AC and Cg horizons:

Hue—10YR, 2.5Y, or 5Y
Value—5 to 8 dry, 4 to 6 moist
Chroma—1 or 2
Texture—silt loam, clay loam, or silty clay loam; thin strata of loamy fine sand, loamy sand, or fine sand in the Cg horizon below a depth of 40 inches in some pedons
Content of clay—18 to 32 percent
Content of sand—5 to 45 percent
Reaction—slightly alkaline to strongly alkaline

Hedville Series

The Hedville series consists of shallow and very shallow, somewhat excessively drained soils on uplands. These soils formed in residuum derived from noncalcareous sandstone. Permeability is moderate. Slopes range from 3 to 30 percent. The mean annual precipitation is 26 inches, and the mean annual temperature is 54 degrees F.

Taxonomic classification: Loamy, mixed, superactive, mesic Lithic Haplustolls

Typical Pedon

Hedville cobbly loam, in an area of native grass, about 5 miles west and 0.5 mile north of Miltonvale, in Cloud County, Kansas; 1,940 feet north and 300 feet east of the southwest corner of sec. 16, T. 8 S., R. 2 W. (Colors are for dry soil unless otherwise indicated.)

A1—0 to 12 inches; dark grayish brown (10YR 4/2) cobbly loam, very dark brown (10YR 2/2) moist; moderate fine granular structure (very fine granular in the upper 1 inch); slightly hard, very friable; many fine roots; many insect burrows and pores; 20 percent pebbles and angular cobbles of sandstone; slightly acid; gradual wavy boundary.

A2—12 to 16 inches; brown (7.5YR 4/2) cobbly loam, dark brown (7.5YR 3/2) moist; weak fine granular structure; slightly hard, very friable; many fine roots; many insect burrows; pebbles and angular cobblestones of weathered sandstone comprise 20 percent of the soil mass; moderately acid; clear irregular boundary extending into cracks and pockets weathered into sandstone bedrock.

R—16 inches; brown sandstone.

Range in Characteristics

Soil moisture regime: Ustic
Depth to lithic contact: 4 to 19 inches to bedrock
Content of clay in the particle-size control section (weighted average): 8 to 22 percent
Content of sand in the particle-size control section (weighted average): 30 to 80 percent
Content of rock fragments in the particle-size control section (weighted average): 5 to 35 percent, by volume
Size of rock fragments in the particle-size control section: Cobbles or stones
Kind of rock fragments in the particle-size control section: Sandstone

A horizon:
Hue—10YR or 7.5YR
Value—4 or 5 dry, 2 or 3 moist
Chroma—1 to 3, dry or moist
Texture—loam, sandy loam, or fine sandy loam
Content of clay—8 to 22 percent
Content of rock fragments—5 to 35 percent stones or cobbles, by volume
Reaction—moderately acid to neutral

Bw or C horizon (if it occurs):
Hue—10YR, 7.5Y, or 5YR
Value—5 or 6 dry, 4 or 5 moist
Chroma—2 to 4, dry or moist
Texture—loam, sandy loam, or fine sandy loam
Content of clay—8 to 22 percent
Content of rock fragments—5 to 35 percent stones or cobbles, by volume
Reaction—moderately acid to neutral

Ida Series

The Ida series consists of very deep, well drained calcareous soils that formed in loess. These soils are on uplands and high stream benches. Permeability is moderate. Slopes range from 2 to 60 percent. The mean annual air temperature is about 49 degrees F, and the mean annual precipitation is about 28 inches.

Taxonomic classification: Fine-silty, mixed, superactive, calcareous, mesic Typic Udorthents

Typical Pedon

Ida silt loam, on a slope of 5 percent, in a cultivated field about 150 feet north and 2,400 feet west of the southeast corner of sec. 7, T. 85 N., R. 41 W.; at elevation 1,395 feet above mean sea level in Crawford County, Iowa; Danbury USGS topographic quadrangle; lat. 42 degrees 10 minutes 57.5 seconds N. and long. 95 degrees 39 minutes 40.6 seconds W. (Colors are for moist soil unless otherwise indicated.)

Ap—0 to 6 inches; 90 percent brown (10YR 4/3) and 10 percent brown (10YR 5/3) silt loam, brown (10YR 5/3) dry; few fine faint brown (7.5YR 4/4) mottles; weak medium subangular blocky structure; friable; common very fine and fine roots; few tubular pores; 22 percent clay; dark brown (10YR 3/3) organic coats; few fine and medium irregular carbonate concretions; strong effervescence; slightly alkaline; clear smooth boundary.

AC—6 to 12 inches; brown (10YR 5/3) silt loam; few fine faint brown (7.5YR 4/4) mottles; weak coarse subangular blocky structure; friable; few fine roots; common fine tubular pores; 22 percent clay; dark brown (10YR 3/3) organic coats; common fine and medium irregular carbonate concretions; strong effervescence; moderately alkaline; clear smooth boundary.

C1—12 to 18 inches; yellowish brown (10YR 5/4) silt loam; few fine faint grayish brown (10YR 5/2) and few fine faint yellowish brown (10YR 5/6) mottles; massive; friable; few fine roots; common fine tubular pores; 22 percent clay; common fine and medium irregular carbonate concretions and few fine irregular very dark brown (7.5YR 2/2) soft masses of manganese accumulation; strong effervescence; moderately alkaline; clear smooth boundary.

C2—18 to 25 inches; yellowish brown (10YR 5/4) silt loam; few fine faint grayish brown (10YR 5/2) and few fine faint yellowish brown (10YR 5/6) mottles; massive; friable; few fine roots; common fine tubular pores; 23 percent clay; few fine irregular carbonate concretions and few fine irregular very dark brown (7.5YR 2/2) soft masses of manganese accumulation; strong effervescence; moderately alkaline; clear smooth boundary.

C3—25 to 31 inches; yellowish brown (10YR 5/4) silt loam; common coarse distinct light brownish gray (10YR 6/2), common coarse faint yellowish brown (10YR 5/6), and few fine distinct strong brown (7.5YR 5/6) mottles; massive; friable; few fine roots; common fine tubular pores; 23 percent clay; few fine irregular carbonate concretions and few fine irregular very dark brown (7.5YR 2/2) soft masses of manganese accumulation; strong effervescence; moderately alkaline; gradual smooth boundary.

C4—31 to 46 inches; yellowish brown (10YR 5/4) silt loam; common coarse distinct light brownish gray (2.5Y 6/2) and common coarse distinct strong

brown (7.5YR 5/6) mottles; massive; friable; common fine tubular pores; 24 percent clay; few fine irregular carbonate concretions and few fine irregular very dark brown (7.5YR 2/2) soft masses of manganese accumulation; strong effervescence; moderately alkaline; gradual smooth boundary.

C5—46 to 59 inches; yellowish brown (10YR 5/4) silt loam; common coarse distinct light brownish gray (2.5Y 6/2) and common coarse distinct strong brown (7.5YR 5/6) mottles; massive; friable; common fine tubular pores; 21 percent clay; few fine irregular dark brown (7.5YR 3/2) soft masses of manganese accumulation; strong effervescence; moderately alkaline; gradual smooth boundary.

C6—59 to 71 inches; yellowish brown (10YR 5/4) silt loam; common coarse distinct light brownish gray (2.5Y 6/2) and common coarse distinct strong brown (7.5YR 5/6) mottles; massive; friable; common fine tubular pores; 21 percent clay; few fine irregular dark brown (7.5YR 3/2) soft masses of manganese accumulation; strong effervescence; moderately alkaline; gradual smooth boundary.

C7—71 to 80 inches; yellowish brown (10YR 5/4) silt loam; common coarse distinct light brownish gray (2.5Y 6/2) and common coarse distinct strong brown (7.5YR 5/6) mottles; massive; friable; 20 percent clay; few fine irregular dark brown (7.5YR 3/2) soft masses of manganese accumulation; strong effervescence; moderately alkaline.

Range in Characteristics

Soil moisture regime: Udic
Mean annual soil temperature: 49 to 56 degrees F
Depth to secondary calcium carbonate: 6 to 10 inches
Thickness of the solum: Less than 10 inches
Particle-size control section (weighted average): Silt loam
Content of clay in the particle-size control section (weighted average): 18 to 25 percent
Content of sand in the particle-size control section (weighted average): Less than 10 percent

A horizon:
Hue—10YR
Value—3
Chroma—2 or 3
Texture—silt loam or silty clay loam
Content of clay—18 to 25 percent
Calcium carbonate equivalent—8 to 12 percent
Reaction—neutral to moderately alkaline
Thickness of the horizon—6 to 10 inches

AC horizon:
Hue—10YR
Value—3 to 5
Chroma—3 or 4
Texture—silt loam
Content of clay—18 to 25 percent
Calcium carbonate equivalent—8 to 12
Reaction—slighty alkaline or moderately alkaline
Thickness of the horizon—6 to 12 inches

C horizon:
Hue—10YR or 2.5Y
Value—4 or 5
Chroma—3 to 6
Texture—silt loam
Content of clay—18 to 25 percent
Calcium carbonate equivalent—8 to 12
Reaction—slightly alkaline or moderately alkaline

Inglewood Series

The Inglewood series consists of very deep, moderately well drained soils that formed in sandy alluvium. These soils are on flood plains. Slopes range from 0 to 3 percent. The mean annual precipitation is about 29 inches, and the mean annual air temperature is about 52 degrees F at the type location.

Taxonomic classification: Sandy, mixed, mesic Oxyaquic Udifluvents

Typical Pedon

Inglewood loamy fine sand, on a slope of 2 percent, in an area of cropland about 3 miles west and 1 mile north of Morse Bluff, in Saunders County, Nebraska; 2,350 feet north and 1,300 feet west of the southeast corner of sec. 15, T. 17 N., R. 5 E. (Colors are for moist soil unless otherwise indicated.)

Ap—0 to 5 inches; dark brown (10YR 3/3) loamy fine sand, grayish brown (10YR 5/2) dry; weak fine granular structure; soft, very friable; few fine roots throughout; few fine tubular pores; neutral; abrupt wavy boundary.

C1—5 to 22 inches; stratified brown (10YR 5/3) sand and dark grayish brown (10YR 4/2) sandy loam, very pale brown (10YR 7/3) and light brownish gray (10YR 6/2) dry; single grain; loose; few fine roots throughout; few fine tubular pores; neutral; gradual smooth boundary.

C2—22 to 30 inches; stratified brown (10YR 5/3) fine sand and very dark grayish brown (10YR 3/2) sand, light brownish gray (10YR 6/2) and grayish brown (10YR 5/2) dry; single grain; loose; few fine roots throughout; few fine tubular pores; neutral; gradual smooth boundary.

C3—30 to 40 inches; pale brown (10YR 6/3) fine sand stratified with dark grayish brown (10YR 4/2) fine sandy loam, very pale brown (10YR 7/3) dry; few fine distinct dark yellowish brown (10YR 4/6 and 10YR 4/4) mottles; single grain; loose; neutral; gradual smooth boundary.

C4—40 to 50 inches; very pale brown (10YR 7/3) fine sand, very pale brown (10YR 8/3) dry; common medium prominent strong brown (7.5YR 5/8) mottles; single grain; loose; neutral; gradual smooth boundary.

C5—50 to 60 inches; very pale brown (10YR 7/3) sand, very pale brown (10YR 8/3) dry; single grain; loose; neutral.

Range in Characteristics

Soil moisture regime: Udic; the soil moisture control section is moist in some part between depths of 3 and 5 feet from November through July.

Mean annual soil temperature: 52 to 54 degrees F

Depth to secondary calcium carbonate: More than 60 inches; profiles which have horizons that effervesce slightly are included in the range.

Depth to redoximorphic concentrations: More than 30 inches

Depth to redoximorphic depletions: More than 30 inches

Particle-size control section (weighted average): Sand, fine sand, loamy sand, or loamy fine sand

Content of clay in the particle-size control section (weighted average): 1 to 10 percent

Other features: Mottles with hues of 7.5YR to 2.5Y are below a depth of 30 inches; some pedons have an AC horizon that has colors and textures that are intermediate between the A and C horizons.

Ap or A horizon:

Hue—10YR
Value—3 to 6 moist, 4 to 7 dry
Chroma—2 or 3, moist or dry
Texture—loamy fine sand or fine sand
Content of clay—3 to 10 percent
Reaction—slightly acid to slightly alkaline
Thickness of the horizon—3 to 10 inches

AC horizon (if it occurs):

Hue—10YR or 2.5Y
Value—3 to 7 moist, 4 to 8 dry
Chroma—2 or 3, moist or dry
Texture—loamy fine sand, loamy sand, fine sand, or sand
Content of clay—1 to 10 percent
Reaction—slightly acid to slightly alkaline
Thickness of the horizon—0 to 4 inches

C horizon:

Hue—10YR or 2.5Y
Value—4 to 7 moist, 5 to 8 dry
Chroma—2 or 3, moist or dry
Texture—sand, fine sand, loamy sand, or loamy fine sand
Content of clay—1 to 10 percent
Reaction—slightly acid to slightly alkaline
Special features—strata of darker and finer textured materials in the upper part of the horizon

Judson Series

The Judson series consists of very deep, well drained soils that formed in silty colluvium. These soils are on footslopes and alluvial fans. Slopes range from 0 to 11 percent. The mean annual temperature is about 50 degrees F, and the mean annual precipitation is about 32 inches.

Taxonomic classification: Fine-silty, mixed, superactive, mesic Cumulic Hapludolls

Typical Pedon

Judson silty clay loam, on a slope of 4 percent, in a cultivated field about 1 mile west and 2 miles north of Bennet, in Lancaster County, Nebraska; 100 feet south and 1,000 feet east of the northwest corner of sec. 28, T. 9 N., R. 8 E.; Bennet USGS topographic quadrangle; lat. 40 degrees 43 minutes 33 seconds N. and long. 96 degrees 32 minutes 10 seconds W. (Colors are for moist soil unless otherwise indicated.)

Ap—0 to 6 inches; black (10YR 2/1) silt loam, dark grayish brown (10YR 4/2) dry; weak fine granular structure; slightly hard, friable; common fine roots throughout; common fine tubular pores; moderately acid; abrupt smooth boundary.

A1—6 to 14 inches; very dark brown (10YR 2/2) silt loam, very dark gray (10YR 3/1) dry; weak fine granular structure; slighty hard, friable; common fine roots throughout; common fine tubular pores; moderately acid; gradual smooth boundary.

A2—14 to 25 inches; very dark brown (10YR 2/2) silty clay loam, very dark grayish brown (10YR 3/2) dry; weak medium granular structure; slightly hard, friable; common fine roots throughout; common fine tubular pores; moderately acid; gradual smooth boundary.

AB—25 to 29 inches; very dark grayish brown (10YR 3/2) silty clay loam, dark grayish brown (10YR 4/2) dry; weak fine subangular blocky structure; slightly

hard, friable; few fine roots throughout; few fine tubular pores; moderately acid; clear smooth boundary.

Bw—29 to 42 inches; dark brown (10YR 3/3) silty clay loam, brown (10YR 5/3) dry; moderate medium prismatic structure parting to moderate fine subangular blocky; hard, firm; few fine roots throughout; few fine tubular pores; moderately acid; gradual smooth boundary.

BC—42 to 55 inches; dark brown (10YR 4/3) silty clay loam, pale brown (10YR 6/3) dry; weak medium prismatic structure; hard, firm; few fine roots throughout; few fine tubular pores; moderately acid; gradual smooth boundary.

C—55 to 60 inches; brown (10YR 5/3) silty clay loam, very pale brown (10YR 7/3) dry; massive; slightly hard, friable; slightly acid.

Range in Characteristics

Soil moisture regime: Udic
Thickness of the solum: 40 to more than 60 inches
Thickness of the mollic epipedon: 32 to 52 inches
Reaction in the solum: Slightly acid or moderately acid in the most acid part
Particle-size control section (weighted average): Silty clay loam
Content of clay in the particle-size control section (weighted average): 30 to 35 percent
Content of sand in the particle-size control section (weighted average): Less than 10 percent

A horizon:
Hue—10YR
Value—2
Chroma—1 or 2
Texture—silty clay loam or silt loam
Content of clay—24 to 32 percent
Reaction—moderately acid to neutral
Special features—as much as 12 inches of overwash with a value of 3 in some pedons

AB horizon:
Hue—10YR
Value—2 or 3
Chroma—2
Texture—silty clay loam
Content of clay—27 to 32 percent
Reaction—moderately acid to neutral

Bw horizon:
Hue—10YR
Value—3 to 5
Chroma—3 or 4
Texture—silty clay loam
Content of clay—30 to 35 percent
Reaction—moderately acid to neutral
Special features—darker coatings on peds are common; mottles of low or high chroma are as shallow as a depth of 30 inches in some pedons

BC horizon:
Hue—10YR
Value—3 to 5
Chroma—3 or 4
Texture—silty clay loam; silt loam is within the range
Content of clay—25 to 32 percent
Reaction—slightly acid to slightly alkaline
Special features—few or common mottles with chroma of 1 to 6 in some pedons

C horizon:
Hue—10YR
Value—3 to 5
Chroma—3 or 4
Texture—silty clay loam; less commonly silt loam
Content of clay—25 to 32 percent
Reaction—slightly acid to slightly alkaline
Special features—few or common mottles with chroma of 1 to 6 in some pedons

Kenridge Series

The Kenridge series consists of very deep, moderately well drained, moderately slowly permeable soils that formed in loamy alluvium. These soils are on flood plains, alluvial fans, and toeslopes. Slopes range from 0 to 2 percent. The mean annual temperature is about 51 degrees F, and the mean annual precipitation is about 29 inches.

Taxonomic classification: Fine-silty, mixed, superactive, mesic Cumulic Hapludolls

Typical Pedon

Kenridge silty clay loam, on a slope of less than 1 percent, in a cultivated field about 1 mile east of Wahoo, in Saunders County, Nebraska; 1,700 feet south and 920 feet west of the northeast corner of sec. 3, T. 14 N., R. 7 E.; Wahoo E. USGS topographic quadrangle; lat. 41 degrees 12 minutes 51 seconds N. and long. 96 degrees 36 minutes 20 seconds W. (Colors are for moist soil unless otherwise indicated.)

Ap—0 to 8 inches; very dark gray (10YR 3/1) silty clay loam, dark gray (10YR 4/1) dry; weak fine granular structure; slightly hard, friable; many fine and medium roots; few fine and medium tubular pores; moderately acid; abrupt smooth boundary.

A—8 to 20 inches; very dark gray (10YR 3/1) silty clay loam, dark gray (10YR 4/1) dry; weak fine

subangular blocky structure; slightly hard, friable; few fine and medium roots; common fine tubular pores; moderately acid; clear smooth boundary.

Bw1—20 to 36 inches; very dark gray (10YR 3/1) silty clay loam, dark gray (10YR 4/1) dry; moderate medium prismatic structure parting to moderate medium subangular blocky; slightly hard, friable; few fine roots; few medium tubular pores; continuous pressure faces; faint black (10YR 2/1) coats on faces of peds; neutral; gradual smooth boundary.

Bw2—36 to 46 inches; very dark gray (10YR 3/1) silty clay loam, gray (10YR 5/1) dry; few fine prominent dark yellowish brown (10YR 4/6) iron masses; strong coarse prismatic structure parting to moderate medium subangular blocky; slightly hard, friable; few fine roots; few medium tubular pores; continuous pressure faces and dark organic coatings; many rounded soft masses of iron-manganese; neutral; gradual smooth boundary.

Bw3—46 to 60 inches; very dark grayish brown (10YR 3/2) silty clay loam; gray (10YR 5/1) dry; few medium prominent dark yellowish brown (10YR 4/6) iron masses in the matrix; moderate medium prismatic structure parting to moderate medium angular blocky; slightly hard, friable; few fine roots; continuous pressure faces and coats; many soft masses of iron-manganese; neutral; gradual wavy boundary.

BC—60 to 80 inches; dark grayish brown (10YR 4/2) clay loam; gray (10YR 6/1) dry; few fine prominent dark yellowish brown (10YR 4/6) iron masses in the matrix; moderate medium prismatic structure parting to weak medium subangular blocky; slightly hard, friable; few fine roots; continuous pressure faces; neutral.

Range in Characteristics

Soil moisture regime: Udic

Depth to secondary calcium carbonate: Free carbonates occur in the solum at a depth of 40 inches or more in some pedons.

Depth to redoximorphic concentrations: 34 to 60 inches

Thickness of the mollic epipedon: From 36 inches to more than 60 inches

Content of clay in the particle-size control section (weighted average): 30 to 35 percent; ranges from 27 to 35 percent

Content of sand in the particle-size control section (weighted average): Less than 30 percent

Other features: Some pedons contain a C horizon.

Ap horizon:
Hue—10YR or N
Value—3 moist, 3 or 4 dry
Chroma—0 to 2
Texture—silty clay loam
Content of clay—27 to 35 percent
Reaction—moderately acid or slightly acid

AB horizon (if it occurs):
Hue—10YR
Value—3 moist, 4 dry
Chroma—1 or 2
Texture—silty clay loam
Content of clay—27 to 35 percent
Reaction—moderately acid or slightly acid

Bw horizon:
Hue—10YR
Value—3 or 4 moist, 4 or 5 dry
Chroma—1 or 2
Texture—silty clay loam
Content of clay—27 to 35 percent
Reaction—slightly acid or neutral

BC horizon:
Hue—10YR
Value—3 or 4 moist, 5 or 6 dry
Chroma—1 or 2
Texture—silty clay loam
Content of clay—27 to 35 percent
Reaction—slightly alkaline or moderately alkaline

Kezan Series

The Kezan series consists of very deep, poorly drained soils that formed in silty alluvial sediments derived from loess. These soils are on flood plains along narrow upland drainageways. Permeability is moderate. Slopes range from 0 to 2 percent. The mean annual temperature is about 50 degrees F, and the mean annual precipitation is about 28 inches at the type location.

Taxonomic classification: Fine-silty, mixed, superactive, nonacid, mesic Mollic Fluvaquents

Typical Pedon

Kezan silt loam, on a north-facing 1 percent slope, in an alfalfa field about 3 miles west of Brainard, in Butler County, Nebraska; 1,360 feet south and 200 feet east of the northwest corner of sec. 14, T. 14 N., R. 3 E. When described, the soil was moist throughout. (Colors are for dry soil unless otherwise indicated.)

Ap—0 to 6 inches; grayish brown (10YR 5/2) silt loam,

very dark grayish brown (10YR 3/2) moist; weak fine granular structure; slightly hard, friable; neutral; abrupt smooth boundary.

C—6 to 13 inches; stratified grayish brown (10YR 5/2) and light brownish gray (10YR 6/2) silt loam, very dark grayish brown (10YR 3/2) and dark grayish brown (10YR 4/2) moist; massive with evident bedding planes; slightly hard, friable; few fine prominent reddish brown (5YR 4/4) iron masses in the soil matrix; neutral; abrupt smooth boundary.

Cg1—13 to 19 inches; stratified dark gray (10YR 4/1) and grayish brown (10YR 5/2) silt loam, very dark gray (10YR 3/1) and dark grayish brown (10YR 4/2) moist; massive with evident bedding planes; slightly hard, friable; few fine prominent reddish brown (5YR 4/4) iron masses in the soil matrix; neutral; abrupt smooth boundary.

Cg2—19 to 32 inches; stratified grayish brown (10YR 5/2) and light brownish gray (10YR 6/2) silt loam, very dark grayish brown (10YR 3/2) and dark grayish brown (10YR 4/2) moist; massive with evident bedding planes; slightly hard, friable; few fine prominent reddish brown (5YR 4/4) iron masses in the soil matrix; neutral; abrupt smooth boundary.

Agb1—32 to 44 inches; dark gray (10YR 4/1) silt loam, very dark gray (10YR 3/1) moist; massive; hard, friable; neutral; gradual wavy boundary.

Agb2—44 to 60 inches; dark gray (N 4/0) silt loam, black (N 2/0) moist; massive; hard, friable; neutral.

Range in Characteristics

Soil moisture regime: Aquic; the soil moisture control section is wet from a depth of 6 to 18 inches to more than 72 inches from November through June.

Depth to redoximorphic concentrations: 4 to 9 inches

Depth to endosaturation: 6 to 18 inches from November through June

Content of clay in the particle-size control section (weighted average): 24 to 35 percent

Content of sand in the particle-size control section (weighted average): 2 to 12 percent

Other features: Typically, free calcium carbonate is not present in the profile but in some pedons occurs at a depth of 12 to 30 inches.

A horizon:

Hue—10YR
Value—4 or 5 dry, 2 or 3 moist
Chroma—1 or 2
Texture—silt loam or silty clay loam
Content of clay—20 to 27 percent
Reaction—neutral or slightly alkaline
Reaction in calcareous overwash phase—slightly alkaline or moderately alkaline

C and Cg horizons:

Hue—10YR or 2.5Y
Value—4 to 6 dry, 2 to 5 moist
Chroma—1 or 2, dry or moist
Redoximorphic concentrations—hue of 7.5YR or 5YR, value of 4, and chroma of 4
Texture—silt loam or silty clay loam
Content of clay—24 to 35 percent
Reaction—neutral to moderately alkaline

Agb horizon (if it occurs):

Hue—10YR, 2.5Y, or N
Value—3 or 4 dry, 2 or 3 moist
Chroma—0 or 1
Redoximorphic concentrations—hue of 7.5YR or 5YR, value of 4, and chroma of 4
Texture—silt loam or silty clay loam
Content of clay—24 to 35 percent
Reaction—neutral to moderately alkaline

Lamo Series

The Lamo series consists of very deep, somewhat poorly drained soils that formed in calcareous loamy alluvium. These soils are on flood plains. Permeability is moderately slow. Slopes range from 0 to 2 percent. The mean annual temperature is 53 degrees F, and the mean annual precipitation is 27 inches at the type location.

Taxonomic classification: Fine-silty, mixed, superactive, calcareous, mesic Cumulic Endoaquolls

Typical Pedon

Lamo silty clay loam, on a slope of less than 1 percent, in an area of cropland about 3 miles east and 1 mile south of Beaver Crossing, in Seward County, Nebraska; 300 feet east and 1,056 feet north of the southwest corner of sec. 9, T. 9 N., R. 2 E. (Colors are for dry soil unless otherwise indicated.)

Ap—0 to 7 inches; dark gray (10YR 4/1) silty clay loam, black (10YR 2/1) moist; weak fine and medium granular structure; slightly hard, friable; common fine roots throughout; slightly alkaline; abrupt smooth boundary.

A—7 to 15 inches; very dark gray (10YR 3/1) silty clay loam, black (10YR 2/1) moist; weak medium granular structure; slightly hard, friable; common fine roots throughout; few fine tubular pores; strong effervescence; slightly alkaline; clear smooth boundary.

AB—15 to 26 inches; gray (10YR 5/1) silty clay loam, very dark gray (10YR 3/1) moist; moderate medium subangular blocky structure; hard, firm; few fine roots throughout; common fine tubular pores; strong effervescence; moderately alkaline; clear smooth boundary.

Bg1—26 to 32 inches; gray (10YR 6/1) silty clay loam, dark gray (10YR 4/1) moist; moderate medium subangular blocky structure; hard, firm; few fine prominent yellowish brown (10YR 5/6) iron masses in the soil matrix: common medium lime concretions; strong effervescence; moderately alkaline; gradual smooth boundary.

Bg2—32 to 46 inches; gray (10YR 6/1) silty clay loam, dark gray (10YR 4/1) moist; weak coarse subangular blocky structure; hard, firm; common medium concretions; strong effervescence; moderately alkaline; gradual smooth boundary.

Cg—46 to 80 inches; gray (10YR 6/1) silty clay loam, dark gray (10YR 4/1) moist; massive; hard, firm; common medium lime concretions; strong effervescence; moderately alkaline.

Range in Characteristics

Soil moisture: The soil is moist in all parts of the soil moisture control section for less than 90 cumulative days in the 120 days following the summer solstice; moist in some part of the soil moisture control section for more than 90 cumulative days in the 120 days following the summer solstice.

Depth to secondary carbonates: Commonly 5 to 10 inches; ranges from 0 to 20 inches

Calcium carbonate equivalent: Commonly 5 to 10 percent; ranges from 1 to 15 percent; accumulations are generally below a depth of 24 inches.

Redoximorphic features: Few fine and common distinct yellowish brown (hue of 10YR or 2.5Y, value of 4, and chroma of 4 to 6) iron concentrations below a depth of 40 inches in the matrix; fine to common prominent greenish gray (5G 5/1) iron depletions in the matrix

Depth to endosaturation: 18 inches (winter and spring); 36 inches or more (summer and fall)

Thickness of the mollic epipedon: 24 to more than 40 inches; the surface layer is slightly lighter colored in some pedons because of recent overwash.

Thickness of the solum: 24 to more than 60 inches

A horizon:

Hue—10YR or 2.5Y
Value—3 to 5 dry, 2 or 3 moist
Chroma—1 or 2
Texture—silt loam, loam, silty clay loam, silty clay, or clay
Reaction—slightly or moderately alkaline
Electrical conductivity (mmhos/cm)—0 to 2

AB horizon and AC horizon (if it occurs):

Hue—10YR or 2.5Y
Value—4 or 5 dry, 2 or 3 moist
Chroma—1 or 2
Texture—silt loam, loam, clay loam, or silty clay loam
Reaction—slightly alkaline or moderately alkaline
Special features—horizon has redoximorphic features; in some pedons, this horizon does not occur but the mollic epipedon is 24 inches thick.

Bg and Cg horizons:

Hue—10YR, 2.5Y, or 5Y
Value—5 to 7 dry, 3 to 6 moist
Chroma—1 or 2
Texture—silt loam, silty clay, clay loam, sandy clay loam, clay, or silty clay loam; fine sandy loam, loamy sand, fine sand, and sand below a depth of 40 inches in some pedons; coarse sand and gravelly coarse sand below a depth of 60 inches in some pedons
Content of clay—28 to 35 percent; thin strata with less than 20 percent clay or more than 35 percent clay in some pedons
Reaction—slightly alkaline or moderately alkaline

Lancaster Series

The Lancaster series consists of well drained soils on uplands. These soils are moderately deep over sandstones or sandy shales. They formed in residuum derived from noncalcareous sandstone and sandy shales. Permeability is moderate. Slopes range from 1 to 16 percent. The mean annual temperature is about 57 degrees F, and the mean annual precipitation about 30 inches.

Taxonomic classification: Fine-loamy, mixed, superactive, mesic Udic Argiustolls

Typical Pedon

Lancaster loam, in an area of native range, about 2 miles north and 1.25 miles west of Bavaria, in Saline County, Kansas; 175 feet north and 45 feet west of the southeast corner of sec. 17, T. 14 S., R. 4 W. (Colors are for dry soil unless otherwise indicated.)

A—0 to 9 inches; dark grayish brown (10YR 4/2) loam, very dark brown (10YR 2/2) moist; weak medium granular structure; hard, friable, slightly plastic and

slightly sticky; moderately acid; few fine roots: gradual smooth boundary.

BA—9 to 16 inches; brown (7.5YR 4/2) clay loam, dark brown (7.5YR 3/2) moist; moderate fine subangular blocky structure; hard, friable, slightly plastic and slightly sticky; few fine roots; less than 5 percent hard sandstone fragments about 2 mm to 1 inch in diameter; moderately acid; gradual smooth boundary.

Bt1—16 to 24 inches; brown (7.5YR 5/4) clay loam, brown (7.5YR 4/4) moist; moderate medium subangular blocky structure; very hard, firm, plastic and sticky; few fine roots; slightly darker clay films on vertical faces of peds and in root channels; slightly acid; gradual smooth boundary.

Bt2—24 to 30 inches; reddish yellow (7.5YR 6/6) sandy clay loam, strong brown (7.5YR 5/6) moist; streaked and splotched with colors that are more yellow and more gray than the soil mass and with few distinct reddish spots; weak medium blocky structure; very hard, firm, plastic and sticky; few fine roots; darker clay films on some faces of peds; neutral; gradual smooth boundary.

Cr—30 inches; partially weathered, sandy shale.

Range in Characteristics

Soil moisture regime: Ustic

Depth to paralithic contact: 20 to 40 inches to sandstone or shale

Depth to argillic horizon: 6 to 20 inches

Thickness of the mollic epipedon: 8 to 20 inches

Content of clay in the particle-size control section (weighted average): 18 to 35 percent

Content of sand in the particle-size control section (weighted average): 20 to 80 percent

Content of pararock fragments 2 mm to 3 inches in diameter in the particle-size control section: 0 to 15 percent, by volume

Content of pararock fragments 3 to 10 inches in diameter in the particle-size control section: 0 to 5 percent, by volume

Kind of pararock fragments in the particle-size control section: Weathered sandstone

A horizon:

Hue—10YR or 7.5YR
Value—4 or 5 dry, 2 or 3 moist
Chroma—1 to 3, dry or moist
Texture—loam, sandy loam, fine sandy loam, or gravelly loam
Content of clay—5 to 26 percent
Content of pararock fragments—0 to 15 percent
Reaction—moderately acid or slightly acid

Bt horizon:

Hue—10YR to 5YR
Value—4 to 6 dry, 3 to 5 moist
Chroma—3 to 6, dry or moist
Texture—loam, clay loam, or sandy clay loam
Content of clay—18 to 35 percent
Content of pararock fragments—0 to 15 percent
Reaction—moderately acid to neutral

C horizon (if it occurs):

Hue—7.5YR or 5YR
Value—5 or 6 dry, 4 or 5 moist
Chroma—4 to 6, dry or moist (variegations of colors more gray, yellow, or red than the soil matrix occur below a depth of 20 inches; the colors are presumed to be inherited from the parent material)
Texture—sandy clay loam, clay loam, fine sandy loam, or loam
Content of clay—12 to 30 percent
Content of pararock fragments—0 to 15 percent
Reaction—slighty acid or neutral

Lex Series

The Lex series consists of very deep, somewhat poorly drained soils that formed in 20 to 40 inches of loamy alluvium deposited over coarse sand or gravelly sand. These soils are on flood plains. Permeability is moderate or moderately slow in the solum and very rapid in the substratum. Slopes range from 0 to 2 percent. The mean annual temperature is about 51 degrees F, and the mean annual precipitation is about 20 inches at the type location.

Taxonomic classification: Fine-loamy over sandy or sandy-skeletal, mixed, superactive, calcareous, mesic Fluvaquentic Endoaquolls

Typical Pedon

Lex silt loam, on a slope of less than 1 percent, in an area of irrigated cropland about 4 miles east of Kearney, in Buffalo County, Nebraska; 150 feet east and 2,000 feet south of the northwest corner of sec. 1, T. 8 N., R. 15 W.; Newark USGS topographic quadrangle; lat. 40 degrees 41 minutes 37 seconds N. and long. 98 degrees 58 minutes 09 seconds W. (Colors are for dry soil unless otherwise indicated.)

Ap—0 to 7 inches; gray (10YR 5/1) silt loam, very dark gray (10YR 3/1) moist; weak medium granular structure; hard, friable; many medium roots; violent effervescence; slightly alkaline; clear smooth boundary.

A1—7 to 9 inches; gray (10YR 5/1) silt loam, very dark gray (10YR 3/1) moist; moderate medium granular structure; hard, friable; common fine roots; violent effervescence; slightly alkaline; clear smooth boundary.

A2—9 to 18 inches; gray (N 5/0) silty clay loam, very dark gray (N 3/0) moist; moderate fine and medium subangular blocky structure; hard, firm; common fine roots; few fine tubular pores; strong effervescence; slightly alkaline; gradual smooth boundary.

C—18 to 23 inches; light gray (2.5Y 7/2) fine sandy loam, grayish brown (2.5Y 5/2) moist; few small and medium prominent dark yellowish brown (10YR 4/4) iron masses in the soil matrix; massive; slightly hard, friable; few fine roots; few fine tubular pores; slight effervescence; slightly alkaline; abrupt smooth boundary.

2Cg—23 to 80 inches; light gray (10YR 7/2) gravelly sand, light brownish gray (10YR 6/2) moist; few large prominent reddish brown (5YR 5/4) iron masses in the soil matrix; single grain; loose; slightly alkaline.

Range in Characteristics

Soil moisture: The soil is moist in the solum from December through April and intermittently moist from May through December. July through September, the driest period, is within the intermittently moist period from May through December.

Depth to secondary carbonates: Calcium carbonate is typically at the surface or within a depth of 10 inches.

Redoximorphic features: Few or common fine and medium faint, distinct, or prominent iron concentrations (hue of 5YR, 7.5YR, or 10YR; value of 3 to 6 moist; and chroma of 2 to 8) are common; these redoximorphic features are in the lower part of the A horizon and throughout the C horizon.

Depth to endosaturation: 1 to 3 feet

Thickness of the mollic epipedon: 10 to 24 inches

Depth to rock fragments: Depth to the coarse sand or gravelly sand is typically 23 to 35 inches but ranges from 20 to 40 inches.

A horizon and AC horizon (if it occurs):

Hue—10YR, 2.5Y, or N
Value—3 to 5 dry, 2 or 3 moist
Chroma—0 to 2
Texture—silt loam, loam, clay loam, or silty clay loam
Electrical conductivity (mmhos/cm)—0 to 4
Reaction—slightly alkaline or moderately alkaline

C horizon:

Hue—10YR or 2.5Y
Value—5 to 7 dry, 4 to 6 moist
Chroma—1 to 3
Texture—loam, silt loam, sandy clay loam, clay loam, very fine sandy loam, fine sandy loam, or sandy loam containing more than 18 percent clay; commonly stratified with various colors and textures of soil material
Electrical conductivity (mmhos/cm)—0 to 4
Reaction—slightly acid to moderately alkaline

2C horizon:

Hue—10YR or 2.5Y
Value—6 to 8 dry, 5 to 7 moist
Chroma—1 to 4
Texture—gravelly sand, gravelly coarse sand, sand, or coarse sand
Content of rock fragments—15 to 35 percent gravel, by volume; ranges from 5 to 35 percent
Reaction—slightly acid to slightly alkaline

Malcolm Series

The Malcolm series consists of very deep, well drained soils that formed in interglacial sediments of Aftonian age. These soils are on uplands. Permeability is moderate. Slopes range from 5 to 25 percent. The mean annual temperature is 53 degrees F, and the mean annual precipitation is about 30 inches.

Taxonomic classification: Fine-silty, mixed, superactive, mesic Typic Argiudolls

Typical Pedon

Malcolm silt loam, on a west-facing slope of 6 percent, in a pasture about 2.5 miles north and 1 mile east of Burr, in Otoe County, Nebraska; 1,670 feet north and 125 feet east of the southwest corner of sec. 14, T. 7 N., R. 10 E.; Burr USGS topographic quadrangle; lat. 40 degrees 34 minutes 16 seconds N. and long. 96 degrees 16 minutes 26 seconds W. (Colors are for moist soil unless otherwise indicated.)

A—0 to 7 inches; very dark gray (10YR 3/1) silt loam, dark gray (10YR 4/1) dry; weak fine and medium subangular blocky structure parting to weak fine granular; slightly hard, friable; few fine roots; slightly acid; gradual smooth boundary.

Bt1—7 to 12 inches; very dark grayish brown (10YR 3/2) silty clay loam, dark grayish brown (10YR 4/2) dry; moderate very fine and fine subangular blocky structure; hard, friable; few fine roots; slightly acid; gradual smooth boundary.

Bt2—12 to 20 inches; brown (10YR 4/3) silty clay loam, brown (10YR 5/3) dry; strong fine and very fine subangular blocky structure; hard, friable; common very dark grayish brown organic or clay coatings on faces of peds; very few fine roots; moderately acid; gradual smooth boundary.

BC—20 to 28 inches; brown (10YR 4/3) silty clay loam, pale brown (10YR 6/3) dry; few coarse prominent strong brown (7.5YR 5/8) mottles; moderate fine and very fine subangular blocky structure; hard, friable; few iron concretions; moderately acid; clear smooth boundary.

C—28 to 60 inches; light brownish gray (2.5Y 6/2) silt loam, pale yellow (2.5Y 8/2) dry; massive; common horizontal planes of cleavage; slightly hard, very friable; moderately acid.

Range in Characteristics

Soil moisture regime: Udic
Mean annual soil temperature: 49 to 52 degrees F
Depth to argillic horizon: 6 to 12 inches
Thickness of the mollic epipedon: 7 to 15 inches
Thickness of the solum: 20 to 40 inches

A horizon:
Hue—10YR or 2.5Y
Value—2 or 3 moist, 3 to 5 dry
Chroma—1 or 2
Texture—silty clay loam or silt loam
Content of clay—17 to 30 percent
Reaction—moderately acid or slightly acid

Bt horizon:
Hue—10YR or 2.5Y
Value—3 to 5 moist, 4 to 6 dry
Chroma—2 or 3
Texture—silty clay loam or silt loam
Content of clay—24 to 35 percent
Reaction—moderately acid or slightly acid

BC horizon:
Hue—10YR or 2.5Y
Value—4 or 5 moist, 5 or 6 dry
Chroma—2 or 3
Texture—silt loam or silty clay loam
Content of clay—24 to 35 percent
Reaction—moderately acid or slightly acid

C horizon:
Hue—10YR, 2.5Y, or 5Y
Value—4 to 7 moist, 6 to 8 dry
Chroma—1 to 3
Texture—silty loam or very fine sandy loam; thin lenses of stratified silty clay loam to fine sandy loam in some pedons
Redoximorphic features—few or common fine and medium distinct relict reddish brown or strong brown in some pedons
Content of clay—12 to 18 percent
Content of sand—20 to 70 percent
Reaction—moderately acid or slightly acid

Malmo Series

The Malmo series consists of very deep, moderately well drained soils that formed in weathered till. These soils are on uplands. Permeability is very slow. Slopes range from 2 to 11 percent. The mean annual precipitation is about 30 inches, and the mean annual air temperature is about 52 degrees F at the type location.

Taxonomic classification: Fine, smectitic, mesic Aquertic Hapludalfs

Typical Pedon

Malmo clay, on a southeast-facing slope of 9 percent, in an area of cropland about 3 miles east and 6 miles north of Tecumseh, in Johnson County, Nebraska; about 1,000 feet west and 100 feet north of the southeast corner of sec. 25, T. 6 N., R. 11 E.; Tecumseh NW. USGS topographic quadrangle; lat. 40 degrees 27 minutes 03 seconds N. and long. 96 degrees 07 minutes 34 seconds W., NAD 83. (Colors are for moist soil unless otherwise indicated.)

Ap—0 to 6 inches; dark brown (7.5YR 3/2) clay, brown (7.5YR 4/3) dry; weak fine granular structure; hard, firm; few fine roots throughout; few fine discontinuous tubular pores; 3 percent rounded mixed metamorphic and sedimentary gravel; slightly acid; clear smooth boundary.

Bt1—6 to 15 inches; 50 percent brown (7.5YR 4/2) and 50 percent yellowish red (5YR 4/6) clay, brown (7.5YR 5/4) and yellowish red (5YR 5/6) dry; moderate fine and medium subangular blocky structure; very hard, very firm; few fine roots throughout; few fine discontinuous tubular pores; discontinuous clay films on faces of peds; 3 percent rounded mixed metamorphic and sedimentary gravel; many medium distinct light gray (10YR 7/2) iron depletions; neutral; clear smooth boundary.

Bt2—15 to 25 inches; 50 percent brown (7.5YR 4/2) and 50 percent yellowish red (5YR 4/6) clay, brown (7.5YR 5/4) and yellowish red (5YR 5/6) dry; moderate fine and medium subangular blocky structure; very hard, very firm; few fine roots throughout; few fine discontinuous tubular pores;

discontinuous clay films on faces of peds; few fine and medium irregular carbonate concretions throughout; 3 percent rounded mixed metamorphic and sedimentary gravel; many medium distinct grayish brown (10YR 5/2) iron depletions; slightly alkaline; clear smooth boundary.

Bt3—25 to 39 inches; yellowish red (5YR 5/8) clay, reddish yellow (5YR 6/8) dry; moderate medium angular blocky structure; very hard, very firm; discontinuous clay films on faces of peds; few medium irregular carbonate concretions; 3 percent rounded mixed metamorphic and sedimentary gravel; many coarse prominent grayish brown (10YR 5/2) iron depletions; slightly alkaline; clear smooth boundary.

Bt4—39 to 43 inches; yellowish red (5YR 5/8) gravelly clay, reddish yellow (5YR 6/8) dry; weak medium angular blocky structure; very hard, very firm; discontinuous clay films on faces of peds; few medium irregular carbonate concretions; 18 percent rounded mixed metamorphic and sedimentary gravel; many coarse prominent grayish brown (10YR 5/2) iron depletions; moderately alkaline; clear smooth boundary.

BC—43 to 54 inches; yellowish red (5YR 5/8) clay loam, reddish yellow (5YR 6/8) dry; weak medium angular blocky structure; hard, firm; few medium irregular carbonate concretions; 3 percent mixed metamorphic and sedimentary gravel; many coarse prominent grayish brown (10YR 5/2) iron depletions; moderately alkaline; gradual smooth boundary.

C—54 to 72 inches; pale brown (10YR 6/3) loam, very pale brown (10YR 8/4) dry; massive; slightly hard, friable; 4 percent rounded mixed metamorphic and sedimentary gravel; common coarse prominent yellowish red (5YR 5/6) soft masses of iron accumulation; slight effervescence; moderately alkaline.

Range in Characteristics

Soil moisture regime: Udic; the soil moisture control section is wet from March through June.

Mean annual soil temperature: 50 to 56 degrees F

Depth to argillic horizon: 4 to 9 inches

Depth to secondary calcium carbonate: 15 to 40 inches

Depth to redoximorphic concentrations: 35 to 90 inches

Depth to redoximorphic depletions: 4 to 9 inches

Depth to episaturation: 12 to 36 inches from March through June

Thickness of the solum: 40 to 72 inches

Content of clay in the particle-size control section (weighted average): 35 to 50 percent

Content of sand in the particle-size control section (weighted average): 20 to 50 percent

Content of rock fragments in the particle-size control section (weighted average): 2 to 25 percent, by volume

Size of rock fragments in the particle-size control section: Gravel

A horizon:

Hue—7.5YR or 10YR
Value—2 to 4 moist, 3 to 5 dry
Chroma—2 or 3
Texture—clay, clay loam, or silty clay loam
Content of clay—35 to 46 percent
Reaction—moderately acid or slightly acid

Bt horizon:

Hue—5YR to 10YR
Value—3 to 5 moist, 4 to 6 dry
Chroma—2 to 8
Texture—clay, clay loam, gravelly clay, or sandy clay
Content of clay—35 to 50 percent
Content of rock fragments—2 to 25 percent gravel
Reaction—slightly acid to slightly alkaline

BC and C horizons:

Hue—2.5Y to 5YR
Value—4 to 6 moist, 5 to 8 dry
Chroma—2 to 8
Texture—dominantly clay loam or loam; stratified clay, sandy loam, or silty clay loam included in the range
Content of clay—20 to 45 percent
Content of rock fragments—2 to 25 percent gravel
Reaction—neutral to moderately alkaline

Morrill Series

The Morrill series consists of very deep, well drained soils that formed in loamy glacial till or outwash deposits. These soils are on uplands. Slopes range from 1 to 30 percent. The mean annual precipitation is about 37 inches, and the mean annual temperature is about 53 degrees F.

Taxonomic classification: Fine-loamy, mixed, superactive, mesic Typic Argiudolls

Typical Pedon

Morrill loam, in an area of grassland about 5 miles east and 2.5 miles north of Hiawatha, in Brown

County, Kansas; 2,475 feet north and 630 feet west of the southeast corner of sec. 7, T. 2 S., R. 18 E. (Colors are for moist soil unless otherwise indicated.)

Ap—0 to 6 inches; very dark grayish brown (10YR 3/2) loam, brown (10YR 4/3) dry; moderate medium granular structure; slightly hard, friable, slightly sticky and slightly plastic; common fine roots; 2 percent mixed pebbles; very strongly acid; clear smooth boundary.

BA—6 to 12 inches; dark brown (10YR 3/3 and 7.5YR 3/4) loam, brown (10YR 4/3) dry; moderate medium granular structure; hard, firm, slightly sticky and slightly plastic; common fine roots; 2 percent mixed pebbles; strongly acid; gradual smooth boundary.

Bt1—12 to 22 inches; dark reddish brown (5YR 3/4) loam, strong brown (7.5YR 4/6) dry; moderate medium subangular blocky structure; hard, firm, slightly sticky and slightly plastic; common fine roots; many faint discontinuous clay films on faces of peds; 2 percent mixed pebbles; moderately acid; gradual smooth boundary.

Bt2—22 to 30 inches; reddish brown (5YR 4/4) sandy clay loam, brown (7.5YR 5/4) dry; moderate medium subangular blocky structure; hard, firm, slightly sticky and slightly plastic; common fine roots; many faint discontinuous clay films on faces of peds; 2 percent mixed pebbles; moderately acid; gradual wavy boundary.

Bt3—30 to 35 inches; yellowish red (5YR 4/6) and brown (7.5YR 4/4) sandy clay loam, strong brown (7.5YR 5/6) dry; moderate medium subangular blocky structure; hard, friable, slightly sticky and slightly plastic; common fine roots; common faint patchy clay films on faces of peds; 2 percent mixed pebbles; slightly acid; gradual wavy boundary.

Bt4—35 to 43 inches; brown (7.5YR 4/4) and strong brown (7.5YR 4/6) sandy clay loam, strong brown (7.5YR 5/6) dry; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common fine roots; few faint patchy clay films on faces of peds; few medium yellowish red (5YR 4/6) relict iron stains; 2 percent mixed pebbles; slightly acid; clear wavy boundary.

BC—43 to 52 inches; strong brown (7.5YR 4/4) fine sandy loam, reddish yellow (7.5YR 6/6) dry; weak fine subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common fine roots; common medium yellowish red (5YR 4/6) relict iron stains; 2 percent mixed pebbles; slightly acid; clear wavy boundary.

2C1—52 to 59 inches; strong brown (7.5YR 4/6) fine sandy loam, reddish yellow (7.5YR 6/6) dry; massive; slightly hard, very friable, slightly sticky and nonplastic; many fine yellowish red (5YR 4/6) relict iron stains; 2 percent mixed pebbles; slightly acid; clear wavy boundary.

2C2—59 to 73 inches; strong brown (7.5YR 4/6) loamy fine sand, reddish yellow (7.5YR 6/6) dry; single grain; loose, nonsticky and nonplastic; common coarse strong brown (7.5YR 5/8) and yellowish red (5YR 5/6) relict iron stains; 2 percent mixed pebbles; slightly acid; gradual smooth boundary.

2C3—73 to 80 inches; strong brown (7.5YR 5/6) sand, reddish yellow (7.5YR 6/6) dry; single grain; loose, nonsticky and nonplastic; common coarse and very coarse rounded clay bodies throughout; 2 percent mixed pebbles; slightly acid.

Range in Characteristics

Soil moisture regime: Udic
Depth to argillic horizon: 6 to 23 inches
Thickness of the mollic epipedon: 10 to 20 inches
Thickness of the solum: 30 to 60 inches
Content of clay in the particle-size control section (weighted average): 18 to 35 percent
Content of sand in the particle-size control section (weighted average): More than 20 percent
Other features: A stony phase is recognized.

A horizon:
Hue—10YR or 7.5YR
Value—2 or 3 moist, 3 to 5 dry
Chroma—1 to 3
Texture—loam, clay loam, stony loam, or very stony loam
Content of clay—15 to 35 percent
Content of rock fragments—0 to 14 percent pebbles
Reaction—neutral to very strongly acid

Bt horizon:
Hue—7.5YR or 5YR
Value—3 or 4 moist, 4 or 5 dry
Chroma—3 to 6
Texture—loam, clay loam, sandy clay loam, gravelly clay loam, or gravelly sandy clay loam
Content of clay—18 to 35 percent
Content of rock fragments—0 to 20 percent pebbles
Reaction—neutral to very strongly acid

2C or C horizon:
Hue—10YR, 7.5YR, or 5YR
Value—4 or 5 moist, 4 to 6 dry
Chroma—3 to 6
Texture—loam, clay loam, fine sandy loam, sandy

loam, sandy clay loam, gravelly loam, gravelly clay loam, gravelly sandy loam, gravelly sandy clay loam, loamy fine sand, or sand; strata of clay in a few pedons
Content of clay—5 to 30 percent
Content of rock fragments—0 to 20 percent pebbles
Reaction—neutral to very strongly acid

Muscotah Series

The Muscotah series consists of very deep, somewhat poorly drained soils that formed in clayey alluvium. These soils are on flood plains. Slopes range from 0 to 2 percent. The mean annual precipitation is about 34 inches, and the mean annual air temperature is about 53 degrees F.

Taxonomic classification: Fine, smectitic, mesic Cumulic Hapludolls

Typical Pedon

Muscotah silty clay loam, in a cultivated area about 4 miles south and 1 mile west of Muscotah, in Brown County, Kansas; 230 feet west and 500 feet north of the southeast corner of sec. 18, T. 4 S., R. 16 E. (Colors are for moist soil unless otherwise indicated.)

Ap—0 to 9 inches; black (10YR 2/1) silty clay loam, very dark grayish brown (10YR 3/2) dry; moderate fine granular structure; hard, friable, slightly sticky and slightly plastic; common fine roots throughout; neutral; clear wavy boundary.

A1—9 to 16 inches; black (10YR 2/1) silty clay loam, very dark gray (10YR 3/1) dry; moderate fine subangular blocky structure; very hard, friable, sticky and plastic; few very fine roots throughout; neutral; gradual smooth boundary.

A2—16 to 23 inches; black (10YR 2/1) silty clay loam, very dark gray (10YR 3/1) dry; moderate fine subangular blocky structure; very hard, firm, sticky and plastic; few very fine roots throughout; few fine prominent yellowish brown (10YR 5/6) soft masses of iron accumulation; neutral; clear smooth boundary.

Bw1—23 to 35 inches; black (10YR 2/1) silty clay, very dark gray (10YR 3/1) dry; moderate fine subangular blocky structure; very hard, very firm, very sticky and very plastic; few very fine roots throughout; few distinct slickensides; common fine prominent yellowish brown (10YR 5/6) soft masses of iron accumulation; neutral; gradual smooth boundary.

Bw2—35 to 44 inches; black (10YR 2/1) silty clay, very dark gray (10YR 3/1) dry; moderate medium subangular blocky structure; very hard, very firm, very sticky and very plastic; common distinct slickensides; common fine distinct dark yellowish brown (10YR 4/4) soft masses of iron accumulation; neutral; gradual smooth boundary.

Bw3—44 to 60 inches; very dark gray (10YR 3/1) silty clay, dark gray (10YR 4/1) dry; moderate fine subangular blocky structure; very hard, very firm, very sticky and very plastic; common distinct slickensides; few fine rounded iron-manganese concretions; common fine faint very dark grayish brown (10YR 3/2) iron depletions; neutral; gradual wavy boundary.

Bw4—60 to 70 inches; very dark gray (10YR 3/1) silty clay, dark gray (10YR 4/1) dry; weak medium subangular blocky structure; very hard, very firm, very sticky and very plastic; common distinct discontinuous intersecting slickensides; few fine rounded iron-manganese concretions and few medium irregular carbonate nodules; common medium distinct dark grayish brown (2.5Y 4/2) iron depletions; neutral; gradual wavy boundary.

Bg—70 to 80 inches; olive gray (5Y 4/2) silty clay, olive gray (5Y 5/2) dry; weak medium subangular blocky structure; very hard, very firm, very sticky and very plastic; free water at a depth of 75 inches; common distinct discontinuous intersecting slickensides; common fine prominent olive brown (2.5Y 4/4) soft masses of iron accumulation; few fine rounded iron-manganese concretions and common fine and medium irregular carbonate nodules; neutral.

Range in Characteristics

Soil moisture regime: Udic
Depth to secondary calcium carbonate: More than 30 inches
Depth to redoximorphic concentrations: 16 to 24 inches
Thickness of the mollic epipedon: More than 36 inches
Content of clay in the particle-size control section (weighted average): 35 to 50 percent
Content of sand in the particle-size control section (weighted average): Less than 20 percent
Other features: A silty overwash phase is recognized; some pedons have a Cg horizon.

A horizon:
Hue—10YR
Value—2 or 3 moist, 3 or 4 dry
Chroma—1 or 2
Texture—silty clay loam
Content of clay—27 to 40 percent; 18 to 27 percent in silty overwash phase
Reaction—moderately acid to neutral

Bw horizon:
Hue—10YR or 2.5Y
Value—2 or 3 moist, 3 to 5 dry
Chroma—1 or 2
Texture—silty clay loam or silty clay
Content of clay—35 to 50 percent
Content of sand—less than 10 percent
Reaction—moderately acid to slightly alkaline

Bg horizon:
Hue—2.5Y to 5Y
Value—2 to 5 moist, 3 to 6 dry
Chroma—1 or 2
Texture—silty clay loam or silty clay
Content of clay—35 to 50 percent
Content of sand—less than 10 percent
Reaction—neutral or slightly alkaline

Nodaway Series

The Nodaway series consists of very deep, moderately well drained soils that formed in alluvium. These soils are on flood plains. Slopes range from 0 to 2 percent. The mean annual air temperature is about 50 degrees F, and the mean annual precipitation is about 30 inches.

Taxonomic classification: Fine-silty, mixed, superactive, nonacid, mesic Mollic Udifluvents

Typical Pedon

Nodaway silt loam, on a nearly level flood plain, in a cultivated field about 3 miles east of Firth, in Lancaster County, Nebraska; 100 feet north and 1,000 feet east of the southwest corner of sec. 29, T. 7 N., R. 8 E.; Firth USGS topographic quadrangle; lat. 40 degrees 32 minutes 19 seconds N. and long. 96 degrees 33 minutes 18 seconds W. (Colors are for moist soil unless otherwise indicated.)

Ap—0 to 7 inches; very dark grayish brown (10YR 3/2) silt loam, dark grayish brown (10YR 4/2) dry; weak fine granular structure; slightly hard, friable; few fine roots throughout; few fine tubular pores; slightly acid; abrupt smooth boundary.

C1—7 to 14 inches; very dark grayish brown (10YR 3/2) silt loam, dark grayish brown (10YR 4/2) dry; massive; slightly hard, friable; few fine dark grayish brown (10YR 4/2) strata; some weak platiness; few fine roots throughout; few fine tubular pores; slightly acid; clear smooth boundary.

C2—14 to 45 inches; very dark grayish brown (10YR 3/2) silt loam, dark grayish brown (10YR 4/2) dry; massive; slightly hard, friable; some platiness due to stratification; many fine and medium dark grayish brown (10YR 4/2) strata; few fine roots throughout; few fine tubular pores; slightly acid; clear smooth boundary.

C3—45 to 60 inches; very dark grayish brown (10YR 3/2) silt loam, dark grayish brown (10YR 4/2) dry; massive; slightly hard, friable; few fine roots throughout; few fine tubular pores; neutral.

Range in Characteristics

Soil moisture regime: Udic; the soil moisture control section is moist in some parts from February through November.
Depth to buried soil (if it occurs): More than 36 inches
Depth to redoximorphic concentrations: 6 to 10 inches
Particle-size control section (weighted average): Silt loam and silty clay loam
Content of clay in the particle-size control section (weighted average): 18 to 28 percent
Content of sand in the particle-size control section (weighted average): Less than 15 percent
Other features: A silty clay substratum phase is recognized.

Ap horizon:
Hue—10YR
Value—3
Chroma—1 or 2
Texture—silt loam
Content of clay—18 to 30 percent
Reaction—slightly acid or neutral

C horizon:
Hue—10YR
Value—3 or 4
Chroma—1 or 2
Texture—silt loam or silty clay loam; only very thin lenses of material coarser than silt loam are permitted at depths about 40 inches; some pedons are sandy below a depth of 40 inches
Content of clay—18 to 28 percent
Reaction—slightly acid or neutral
Special features—mottles are few or common of both high and low chroma; some strata have hue of 10YR, value of 4 or 5, and chroma of 2, 3, or 4; dark, medium textured, or moderately fine textured buried soils below a depth of 36 inches in some pedons

Obert Series

The Obert series consists of very deep, poorly drained and very poorly drained soils that formed in calcareous loamy alluvium. These soils are on flood

plains. Permeability is moderately slow. Slopes range from 0 to 2 percent. The mean annual temperature is about 50 degrees F, and the mean annual precipitation is about 25 inches.

Taxonomic classification: Fine-silty, mixed, superactive, calcareous, mesic Cumulic Endoaquolls

Typical Pedon

Obert silt loam, on a slope of less than 1 percent, in an area of native grass about 1 mile west and 1 mile north of Creighton, in Knox County, Nebraska; 1,500 feet south and 300 feet east of the northwest corner of sec. 20, T. 29 N., R. 5 E. (Colors are for dry soil unless otherwise indicated.)

A1—0 to 10 inches; gray (10YR 5/1) silt loam, very dark gray (10YR 3/1) moist; moderate fine granular structure; slightly hard, friable; violent effervescence; moderately alkaline; gradual smooth boundary.

A2—10 to 25 inches; dark gray (10YR 4/1) silty clay loam, black (10YR 2/1) moist; weak fine granular structure; hard, firm; few fine distinct light yellowish brown (10YR 6/4) iron masses in the matrix; violent effervescence; moderately alkaline; gradual smooth boundary.

ACg—25 to 40 inches; dark gray (10YR 4/1) silty clay loam, very dark gray (10YR 3/1) moist; weak medium and coarse subangular blocky structure; hard, firm; few fine distinct brown (10YR 4/3) iron masses in the matrix; slightly alkaline; clear smooth boundary.

Cg—40 to 60 inches; stratified dark gray (10YR 4/1) and light brownish gray (10YR 6/2) loam, very dark gray (10YR 3/1) and dark grayish brown (10YR 4/2) moist; massive; slightly hard, friable; slightly alkaline.

Range in Characteristics

Soil moisture: The soil moisture control section is wet from November through June and moist from July through October.

Mean annual soil temperature: 46 to 50 degrees F

Depth to secondary calcium carbonate: 0 to 10 inches; the calcium carbonate equivalent in the A horizon commonly is 5 to 10 percent and ranges mostly from 1 to 15 percent.

Depth to redoximorphic concentrations: 4 to 16 inches

Depth to episaturation: More than 6 to 18 inches from November through June

Thickness of the mollic epipedon: More than 24 inches

Thickness of the solum: 24 to 48 inches

A horizon:
Hue—10YR, 5Y, or N
Value—3 to 5 dry, 2 or 3 moist
Chroma—0 to 2
Texture—silt loam or silty clay loam
Content of clay—18 to 35 percent
Content of sand—less than 15 percent
Reaction—slightly alkaline or moderately alkaline

ACg horizon (if it occurs):
Hue—10YR to 5Y
Value—3 to 5 dry, 2 to 4 moist
Chroma—1 or 2
Texture—silt loam or silty clay loam
Content of clay—18 to 35 percent
Content of sand—less than 15 percent
Reaction—slightly alkaline or moderately alkaline
Special features—this horizon is absent in some pedons but the mollic epipedon is at least 24 inches thick

Cg horizon:
Hue—10YR, 2.5Y, or 5Y
Value—4 to 7 dry, 3 to 6 moist
Chroma—1 or 2
Texture—silt loam or silty clay loam
Content of clay—18 to 35 percent
Content of sand—less than 15 percent
Reaction—slightly alkaline or moderately alkaline

Olmitz Series

The Olmitz series consists of deep, moderately well drained soils that formed in loamy local alluvium. These soils are on footslopes or alluvial fans. Permeability is moderate. Slopes range from 2 to 14 percent. The mean annual temperature is about 51 degrees F, and the mean annual precipitation is about 32 inches.

Taxonomic classification: Fine-loamy, mixed, superactive, mesic Cumulic Hapludolls

Typical Pedon

Olmitz loam, on a southwest-facing slope of 3 percent, in an area of formerly cultivated pasture about 1 mile west and 7 miles north of Patterson, in Madison County, Iowa; 1,940 feet north and 740 feet east of the southwest corner of sec. 30, T. 77 N., R. 26 W. (Colors are for moist soil unless otherwise indicated.)

Ap—0 to 7 inches; black (10YR 2/1) loam, very dark brown (10YR 2/2) kneaded, grayish brown (10YR 5/2) dry; moderate fine granular structure; friable; moderately acid; clear smooth boundary.

A1—7 to 15 inches; very dark brown (10YR 2/2) clay loam, grayish brown (10YR 5/2) dry; weak very fine and fine subangular blocky and moderate fine granular structure; friable; many wormcasts; common very fine tubular pores and root channels; moderately acid; gradual smooth boundary.

A2—15 to 23 inches; very dark brown (10YR 2/2) clay loam, very dark grayish brown (10YR 3/2) kneaded, dark grayish brown to grayish brown (10YR 4/2 and 10YR 5/2) dry; moderate fine and very fine subangular blocky structure; friable; common very fine tubular pores and root channels; moderately acid; gradual smooth boundary.

A3—23 to 30 inches; very dark grayish brown (10YR 3/2) clay loam, some peds have very dark brown (10YR 2/2) organic coatings, very dark grayish brown (10YR 3/2) kneaded, dark grayish brown to grayish brown (10YR 4/2 and 10YR 5/2) dry; moderate fine subangular blocky structure with some very fine blocks; friable; common very fine tubular pores and root channels; an occasional gravel-size pebble 2 to 5 mm in diameter; moderately acid; gradual smooth boundary.

Bw1—30 to 41 inches; dark brown (10YR 3/3) clay loam, some peds have very dark grayish brown (10YR 3/2) organic coatings, brown (10YR 4/3) kneaded; weak coarse prismatic and weak coarse blocky structure that parts to weak very fine and fine subangular blocky; friable; common very fine tubular pores; a number of gravel-size pebbles 2 to 5 mm in diameter; slightly acid; gradual smooth boundary.

Bw2—41 to 48 inches; mostly dark brown (10YR 3/3) with some brown (10YR 4/3) clay loam, brown (10YR 4/3) kneaded; few fine faint yellowish brown (10YR 5/6) mottles; weak coarse prismatic and weak coarse blocky structure parting to weak very fine and fine subangular blocky; friable; a few fine dark concretions (oxides); few to common very fine tubular pores; slightly acid; gradual smooth boundary.

BC—48 to 60 inches; brown (10YR 4/3) clay loam; weak fine subangular blocky structure; friable; common very fine tubular pores; slightly acid.

Range in Characteristics

Soil moisture regime: Udic

Thickness of the solum: 36 to 65 inches; solum lacks stones

Thickness of the mollic epipedon: 36 to 56 inches

Solum reaction: Slightly acid or moderately acid but pedons with strongly acid horizons are in the range. Carbonates typically are leached to a depth of 6 feet or more.

Particle-size control section (weighted average): Loam and clay loam

Content of clay in the particle-size control section (weighted average): 24 to 34 percent

Content of sand in the particle-size control section (weighted average): 20 to 52 percent

Other features: Horizon boundaries are gradual or diffuse, except for the Ap horizon; a few high and low chroma redoxmorphic features are present in the lower part of the B or C horizons in some pedons.

A horizon:

Hue—10YR

Value—2 or 3

Chroma—1 or 2; colors with value of 3 and chroma of 2 or 3 are present below 32 inches, but kneaded color or interior color of peds has value of 4 within depths of 40 inches or less; recent deposition of very dark grayish brown (10YR 3/2) loam up to 18 inches thick in some pedons

Texture—loam or clay loam

Content of clay—24 to 32 percent

Content of sand—20 to 52 percent

Reaction—slightly acid or moderately acid

B horizon:

Hue—10YR

Value—3 or 4

Chroma—1 or 2

Texture—clay loam; thin clay films in this horizon but B/A clay ratio is less than 1.2 in some pedons

Content of clay—28 to 34 percent

Content of sand—20 to 45 percent

Reaction—slightly acid or moderately acid

Pahuk Series

The Pahuk series consists of very deep, excessively drained soils that formed in sandy alluvium and outwash material. These soils are on paleovalley side slopes and glaciated uplands. Permeability is rapid. Slopes range from 5 to 17 percent. The mean annual precipitation is about 29 inches, and the mean annual air temperature is about 52 degrees F at the type location.

Taxonomic classification: Mixed, mesic Typic Udipsamments

Typical Pedon

Pahuk loamy fine sand, on a southwest-facing slope of 7 percent, in an area of abandoned cropland about 1 mile east and 1 mile south of Wahoo, in Saunders County, Nebraska; 460 feet west and 225 feet north of the southeast corner of sec. 11, T. 14 N., R. 7 E. (Colors are for moist soil unless otherwise indicated.)

A—0 to 6 inches; brown (10YR 4/3) loamy fine sand, brown (10YR 5/3) dry; weak fine granular structure; soft, very friable; common fine roots throughout; common fine and medium tubular pores; moderately acid; abrupt smooth boundary.

AC—6 to 14 inches; brown (10YR 5/3) fine sand, very pale brown (10YR 7/3) and light gray (10YR 7/2) dry; single grain; loose; few fine roots throughout; few fine tubular pores; moderately acid; gradual smooth boundary.

C1—14 to 40 inches; pale brown (10YR 6/3) fine sand, very pale brown (10YR 7/3) and light gray (10YR 7/2) dry; single grain; loose; few fine roots throughout; few fine tubular pores; neutral; gradual smooth boundary.

C2—40 to 60 inches; pale brown (10YR 6/3) fine sand, very pale brown (10YR 7/3) and light gray (10YR 7/2) dry; few fine prominent brownish yellow (10YR 6/6) soft masses of iron accumulation; single grain; loose; neutral.

Range in Characteristics

Soil moisture regime: Udic
Mean annual soil temperature: 49 to 52 degrees F
Reaction: Moderately acid to slightly alkaline
Redoximorphic features: Redoximorphic concentrations with hues of 7.5YR to 2.5Y are in the C horizons in most pedons. The redoximorphic features are relict and are not indicative of present drainage conditions.

A horizon:
Hue—10YR
Value—3 or 4 moist, 4 or 5 dry
Chroma—2 to 4
Texture—fine sandy loam or loamy fine sand
Content of clay—2 to 12 percent
Content of sand—72 to 88 percent

AC horizon (if it occurs):
Hue—10YR
Value—4 or 5 moist, 6 or 7 dry
Chroma—2 to 4
Texture—fine sand or loamy fine sand
Content of clay—1 to 12 percent
Content of sand—72 to 95 percent

C horizon:
Hue—10YR
Value—5 to 7 moist, 6 to 8 dry
Chroma—2 to 4
Texture—fine sand, sand, loamy sand, or loamy fine sand
Content of clay—0 to 18 percent
Content of sand—72 to 98 percent

Pawnee Series

The Pawnee series consists of very deep, moderately well drained soils that formed in glacial till. These soils are on uplands. Permeability is slow or very slow. Slopes range from 0 to 12 percent. The mean annual precipitation is about 30 inches, and the mean annual temperature is about 54 degrees F.

Taxonomic classification: Fine, smectitic, mesic Oxyaquic Vertic Argiudolls

Typical Pedon

Pawnee loam, in a cultivated area about 4 miles north of Pawnee City, in Pawnee County, Nebraska; 1,585 feet west and 350 feet south of the northeast corner of sec. 2, T. 2 N., R. 11 E.; Steinauer USGS topographic quadrangle; lat. 40 degrees 10 minutes 27 seconds N. and long. 96 degrees 08 minutes 05 seconds W. (Colors are for moist soil unless otherwise indicated.)

Ap—0 to 6 inches; very dark brown (10YR 2/2) loam, dark grayish brown (10YR 4/2) dry; moderate fine and very fine granular structure; many fine and medium and few coarse roots throughout; common fine tubular pores; slightly hard, friable; moderately acid; abrupt smooth boundary.

A—6 to 10 inches; very dark brown (10YR 2/2) clay loam, very dark grayish brown (10YR 3/2) dry; moderate medium granular structure; many fine and medium and few coarse roots throughout; common fine tubular pores; slightly hard, friable; moderately acid; clear smooth boundary.

BA—10 to 14 inches; dark brown (10YR 3/3) clay loam, dark yellowish brown (10YR 3/4) dry; moderate fine and medium subangular blocky structure; hard, friable; common fine and few medium roots throughout; common fine tubular pores; few fine prominent dark reddish brown (5YR 3/4) iron masses; moderately acid; gradual smooth boundary.

Bt1—14 to 24 inches; dark grayish brown (10YR 4/2) clay, brown (10YR 4/3) dry; moderate medium and coarse subangular blocky structure; extremely hard, very firm; common fine and few medium roots throughout; common fine tubular pores; thin continuous organic coatings on faces of peds; 2 percent gravel, by volume; few fine and medium prominent reddish brown (5YR 4/4) iron masses; slightly acid; gradual smooth boundary.

Bt2—24 to 32 inches; brown (10YR 4/3) clay, dark yellowish brown (10YR 4/4) dry; weak coarse subangular blocky structure; extremely hard, very firm; few fine and medium roots throughout; few fine tubular pores; thin continuous organic coatings on faces of peds; 2 percent gravel, by volume; common medium faint grayish brown (10YR 5/2), strong brown (7.5YR 5/6), and prominent reddish brown (5YR 5/4) iron masses; neutral; gradual smooth boundary.

Bt3—32 to 45 inches; olive brown (2.5Y 4/4) clay, light olive brown (2.5Y 5/4) dry; weak coarse subangular blocky structure; very hard, very firm; few fine and medium roots throughout; few fine tubular pores; thin patchy organic coatings on faces of peds; 2 percent gravel, by volume; many medium distinct grayish brown (10YR 5/2) and prominent brown (7.5YR 5/4) iron masses; moderately alkaline; gradual smooth boundary.

BC—45 to 53 inches; mixed grayish brown (2.5Y 5/2) and yellowish brown (10YR 5/6) clay, light olive brown (2.5Y 5/4) and dark yellowish brown (10YR 4/4) dry; weak medium subangular blocky structure; very hard, very firm; few fine and medium roots throughout; few fine tubular pores; few medium lime concretions; 2 percent gravel, by volume; many medium prominent dark brown (7.5YR 4/4) iron masses; moderately alkaline; clear smooth boundary.

C—53 to 80 inches; grayish brown (2.5Y 5/2) clay loam, light olive brown (2.5Y 5/4) dry; massive; small iron and manganese concretions; 2 percent gravel, by volume; few medium and large soft masses of lime; many coarse distinct grayish brown (10YR 5/2) iron masses; moderately alkaline.

Range in Characteristics

Soil moisture regime: Udic; the soil moisture control section is wet from March through May.
Mean annual soil temperature: 51 to 56 degrees F
Depth to argillic horizon: 7 to 19 inches
Depth to secondary calcium carbonate: 29 to 54 inches
Depth to redoximorphic concentrations: 7 to 13 inches
Depth to episaturation: 12 to 36 inches from March to May
Thickness of the mollic epipedon: 10 to 19 inches; commonly includes the upper part of the B horizon
Thickness of the solum: 40 to 60 inches
Content of clay in the particle-size control section (weighted average): 40 to 48 percent
Content of sand in the particle-size control section (weighted average): 20 to 45 percent
Content of rock fragments in the particle-size control section (weighted average): 0 to 5 percent, by volume
Size of rock fragments in the particle-size control section: Gravel
Other features: Some pedons have a BA horizon.

A horizon:
Hue—10YR
Value—2 or 3 moist, 3 to 5 dry
Chroma—1 or 2
Texture—loam, clay loam, or clay
Content of clay—15 to 41 percent
Reaction—moderately acid to neutral

Bt horizon:
Hue—10YR, 2.5Y, or 5Y
Value—3 to 5 moist, 3 to 6 dry
Chroma—2 to 4
Redoximorphic concentrations—hue of 7.5YR or 5YR, value of less than 5, and chroma of less than 6
Texture—clay
Content of clay—40 to 48 percent
Content of rock fragments—0 to 5 percent gravel, by volume
Reaction—slightly acid to moderately alkaline

BC horizon:
Hue—10YR, 2.5Y, or 5Y
Value—5 or 6, moist or dry
Chroma—2 to 6
Redoximorphic concentrations—hue of 7.5YR or 5YR, value of less than 5, and chroma of less than 4
Texture—clay
Content of clay—40 to 48 percent
Content of rock fragments—0 to 5 percent gravel
Reaction—slightly alkaline or moderately alkaline

C horizon:
Hue—10YR, 2.5Y, 5Y, or N
Value—5 moist, 5 or 6 dry
Chroma—0 to 4
Redoximorphic concentrations—hue of 10YR,

7.5YR, or 5YR; value of less than 5; and chroma of less than 4
Texture—clay loam, sandy clay loam, or loam
Content of clay—15 to 40 percent
Content of rock fragments—0 to 5 percent gravel, by volume
Reaction—slightly alkaline or moderately alkaline

Platte Series

The Platte series consists of soils that are shallow over coarse sand to gravelly coarse sand. These soils are somewhat poorly drained. They formed in sandy and loamy alluvium deposited over coarse sand or gravelly sand on river valley flood plains. Permeability is moderate or moderately rapid in the upper part and very rapid in the lower part. Slopes range from 0 to 3 percent but are typically less than 1 percent. The mean annual temperature is about 51 degrees F, and the mean annual precipitation is about 25 inches at the type location.

Taxonomic classification: Sandy, mixed, mesic Aeric Fluvaquents

Typical Pedon

Platte loam, on a slope of less than 1 percent, in an area of irrigated cropland about 4 miles north and 2.5 miles west of Kenesaw, in Adams County, Nebraska; about 1,300 feet west and 1,050 feet north of the southeast corner of sec. 6, T. 8 N., R. 12 W.; Denman USGS topographic quadrangle; lat. 40 degrees 41 minutes 09 seconds N. and long. 98 degrees 42 minutes 35 seconds W. When described, the soil was moist throughout. (Colors are for dry soil unless otherwise indicated.)

Ap—0 to 5 inches; dark gray (10YR 4/1) loam, very dark gray (10YR 3/1) moist; weak fine granular structure; soft, friable; strong effervescence; moderately alkaline; abrupt smooth boundary.

A—5 to 8 inches; dark gray (10YR 4/1) very fine sandy loam, very dark gray (10YR 3/1) moist; common medium distinct brown (7.5YR 5/4) iron masses in the soil matrix; weak medium and fine granular structure; soft, very friable; strong effervescence; moderately alkaline; clear smooth boundary.

C—8 to 16 inches; light gray (10YR 7/2) very fine sandy loam, grayish brown (10YR 5/2) moist; common fine to coarse distinct brown (7.5YR 5/4) iron masses in the soil matrix; massive; soft, very friable; strata of loamy sand in the lower part; strong effervescence; moderately alkaline; gradual smooth boundary.

2Cg—16 to 80 inches; light gray (10YR 7/2) gravelly coarse sand, light brownish gray (10YR 6/2) moist; single grain; loose; slightly alkaline.

Range in Characteristics

Soil moisture: The soil is moist in the solum from December through April and intermittently moist from May through December. July through September, the driest period, is within the intermittently moist period from May through December.

Depth to secondary carbonates: Typically more than a depth of 80 inches; beginning within a depth of 40 inches in some pedons

Depth to secondary calcium carbonate: Calcium carbonate typically is disseminated throughout the A horizon but does not occur in some pedons.

Redoximorphic features: Common fine and medium yellowish brown to brown (hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 4 to 6) iron masses or concentrations

Depth to endosaturation: 1 to 3 feet

Thickness of the mollic colors: 6 to 9 inches; corresponds to the thickness of the A horizon

Depth to rock fragments: 10 to 20 inches

Other features: Some pedons have an AC horizon.

A horizon:

Hue—10YR or 2.5Y
Value—4 or 5 dry, 2 or 3 moist
Chroma—1 or 2
Texture—loam, fine sandy loam, silty clay loam, silt loam, very fine sandy loam, sandy loam, loamy fine sand, or loamy sand
Reaction—neutral to moderately alkaline

C horizon:

Hue—10YR or 2.5Y
Value—6 to 8 dry, 4 to 6 moist
Chroma—1 to 3
Texture—loam, very fine sandy loam, fine sandy loam, or sandy loam; loamy fine sand, loamy sand, or sand in the lower part of some pedons
Content of rock fragments—0 to 5 percent gravel, by volume
Calcium carbonate equivalent—0 to 10 percent
Reaction—neutral to moderately alkaline

2Cg horizon:

Hue—10YR or 2.5Y
Value—6 to 8 dry, 4 to 6 moist
Chroma—1 to 4
Texture—coarse sand, gravelly coarse sand, or gravelly sand
Content of rock fragments—typically 15 to 35 percent gravel, by volume; ranges from 2 to 35

percent; the upper part of the horizon commonly contains less gravel than the lower part; stratification of the sandy and gravelly layers is common
Calcium carbonate equivalent—0 to 5 percent
Reaction—typically neutral or slightly alkaline; ranges from neutral to moderately alkaline

Pohocco Series

The Pohocco series consists of very deep, well-drained soils that formed in loess. These soils are on uplands. Slopes range from 2 to 30 percent. The mean annual precipitation is about 28 inches, and the mean annual temperature is about 51 degrees F.

Taxonomic classification: Fine-silty, mixed, superactive, mesic Typic Eutrudepts

Typical Pedon

Pohocco silty clay loam, on a slope of 12 percent, in an area of cropland about 4 miles north and 2 miles west of Prague, in Saunders County, Nebraska; located about 2,325 feet west and 300 feet south of the northeast corner of sec. 16, T. 16 N., R. 5 E.; Prague USGS topographic quadrangle; lat. 41 degrees 21 minutes 52 seconds N. and long. 96 degrees 51 minutes 33 seconds W. (Colors are for moist soil unless otherwise indicated.)

Ap—0 to 6 inches; dark grayish brown (10YR 4/2) silty clay loam; grayish brown (10YR 5/2) dry; weak fine granular structure; slightly hard, very friable; many fine roots throughout; common fine and medium tubular pores; neutral; abrupt smooth boundary.

Bw—6 to 15 inches; olive brown (2.5Y 4/4) silt loam, light olive brown (2.5Y 5/4) dry; common fine faint grayish brown (2.5Y 5/2) and few distinct yellowish brown (10YR 5/6) iron masses in the matrix; the matrix color and iron accumulations are relict redoximorphic features; weak coarse subangular blocky structure parting to moderate medium granular; slightly hard, friable; many fine roots throughout; common fine and medium tubular pores; few distinct dark grayish brown (10YR 4/2) continuous organic coats on vertical faces of peds; neutral; clear wavy boundary.

Bk1—15 to 20 inches; olive brown (2.5Y 4/4) silt loam, light yellowish brown (2.5Y 6/4) dry; common fine faint grayish brown (2.5Y 5/2) and few prominent strong brown (7.5YR 5/6) iron masses in the matrix; the matrix color and iron accumulations are relict redoximorphic features; weak coarse subangular blocky structure parting to moderate medium granular; slightly hard, friable; few fine roots throughout; common fine tubular pores; common fine and medium soft masses of carbonates; violent effervescence; slightly alkaline; gradual smooth boundary.

Bk2—20 to 28 inches; olive brown (2.5Y 4/4) crushed silt loam, light yellowish brown (2.5Y 6/4) dry; common medium faint grayish brown (2.5Y 5/2) and few prominent strong brown (7.5YR 5/8) mottles; weak coarse subangular blocky structure parting to moderate medium granular; friable; few fine roots throughout; common fine tubular pores; few fine rounded soft masses of iron-manganese; fine and medium soft masses of carbonates; violent effervescence; moderately alkaline (7.6); gradual smooth boundary.

C—28 to 60 inches; light olive brown (2.5Y 5/4) silt loam, pale yellow (2.5Y 7/4) dry; common coarse faint light brownish gray (2.5Y 6/2) and few prominent yellowish red (5YR 5/8) iron masses in the matrix; the matrix color and iron accumulations are relict redoximorphic features; massive; slightly hard, friable; few fine roots throughout; common fine tubular pores; common fine rounded soft masses of iron-manganese; few medium soft masses of carbonates and carbonate nodules; violent effervescence; slightly alkaline (7.5).

Range in Characteristics

Soil moisture regime: Udic
Depth to secondary calcium carbonate: 12 to 40 inches
Depth to cambic horizon: 3 to 7 inches
Thickness of the solum: 20 to 46 inches
Content of clay in the particle-size control section (weighted average): 20 to 30 percent
Other features: The matrix color and iron accumulations are relict features and are not indicative of present drainage conditions.

A horizon:
Hue—10YR or 2.5Y
Value—3 or 4 moist, 5 or 6 dry
Chroma—2 to 4
Texture—silty clay loam or silt loam
Content of clay—20 to 35 percent
Reaction—slightly acid to slightly alkaline
Thickness of the horizon—less than 4 inches if mollic colors are present

Bw horizon:
Hue—10YR to 5Y
Value—4 to 6 moist, 5 to 7 dry
Chroma—2 to 4
Texture—silty clay loam or silt loam

Content of clay—20 to 35 percent
Reaction—neutral to slightly alkaline

Bk horizon:
Hue—10YR to 5Y
Value—4 to 6 moist, 5 to 7 dry
Chroma—2 to 4
Texture—silt loam
Content of clay—20 to 27 percent
Calcium carbonate equivalent—0 to 5 percent
Reaction—neutral or slightly alkaline

C horizon:
Hue—7.5YR to 5Y
Value—4 to 6 moist, 5 to 7 dry
Chroma—2 to 6
Texture—silt loam
Content of clay—20 to 27 percent
Calcium carbonate equivalent—1 to 10 percent
Reaction—slightly alkaline

Salmo Series

The Salmo series consists of very deep, somewhat poorly drained and poorly drained soils that formed in silty alluvium. These soils are on flood plains. Permeability is moderate or moderately slow in the solum and moderately slow or slow in the underlying material. Slopes are less than 1 percent. The mean annual precipitation is about 23 inches, and the mean annual temperature is about 47 degrees F.

Taxonomic classification: Fine-silty, mixed, superactive, calcareous, mesic Cumulic Endoaquolls

Typical Pedon

Salmo silt loam, on a slope of less than 1 percent, in an area of native pasture about 1 mile east and 4 miles south of Mount Vernon; in Davison County, South Dakota; 530 feet south and 1,285 feet west of the northeast corner of sec. 14, T. 102 N., R. 62 W. When described, the soil was moist throughout. (Colors are for moist soil unless otherwise stated.)

Az—0 to 5 inches; black (10YR 2/1) silt loam, very dark gray (10YR 3/1) dry; weak fine granular structure; slightly hard, friable, slightly sticky; very few fine accumulations of salt; slight effervescence; moderately alkaline; clear wavy boundary.

Bz1—5 to 10 inches; black (10YR 2/1) silt loam, dark gray (10YR 4/1) dry; weak medium prismatic structure parting to weak medium and fine subangular blocky; hard, friable, slightly sticky; many fine segregations of salt; few fine accumulations of gypsum; strong effervescence; moderately alkaline; clear wavy boundary.

Bz2—10 to 24 inches; black (10YR 2/1) silt loam, dark gray (10YR 4/1) dry; weak medium prismatic structure parting to weak medium and fine subangular blocky; hard, friable, slightly sticky; many fine accumulations of salt; common nests and crystals of gypsum; violent effervescence; moderately alkaline; clear wavy boundary.

Bkyg1—24 to 32 inches; very dark grayish brown (2.5Y 3/2) silt loam, grayish brown (2.5Y 5/2) dry; common medium faint light olive brown (2.5Y 5/6) mottles; weak coarse and medium subangular blocky structure; very hard, friable, slightly sticky; many nests and crystals of gypsum and other salts; few fine accumulations of carbonates; violent effervescence; slightly alkaline; gradual wavy boundary.

Bkyg2—32 to 47 inches; dark grayish brown (2.5Y 4/2) silt loam, grayish brown (2.5Y 5/2) dry; few streaks of very dark grayish brown (2.5Y 3/2) silt loam; common fine and medium distinct light olive brown (2.5Y 5/6) mottles; weak coarse subangular blocky structure; very hard, friable, slightly sticky; many nests and crystals of gypsum and other salts; common fine accumulations of carbonates; violent effervescence; slightly alkaline; clear wavy boundary.

Cg—47 to 60 inches; dark grayish brown (2.5Y 4/2) silty clay loam, grayish brown (2.5Y 5/2) dry; common fine and medium distinct light olive brown (2.5Y 5/6) mottles; massive; very hard, friable, slightly sticky; violent effervescence; moderately alkaline.

Range in Characteristics

Soil moisture: Soil is wet in the control section from November through July and moist from August through October.
Mean annual soil temperature: 43 to 50 degrees F
Electrical conductivity (mmhos/cm)*:* 4 to 16 (upper 20 inches); 3 to 10 or more (below a depth of 20 inches)
Depth to redoximorphic concentrations: 13 to 45 inches
Depth to episaturation: 18 to 36 inches from November through June
Thickness of the mollic epipedon: 24 to more than 60 inches
Other features: Some pedons have a Byz or Byg horizon.

A horizon:
Hue—10YR, 2.5Y, 5Y, or N
Value—2 or 3 moist, 3 or 4 dry

Chroma—0 or 1
Texture—silt loam or silty clay loam
Sodium adsorption ratio (SAR)—less than 13
Electrical conductivity (mmhos/cm)—4 to 16
Content of clay—15 to 40 percent
Content of sand—2 to 35 percent
Reaction—neutral to moderately alkaline

B horizon:
Hue—10YR, 2.5Y, 5Y, or N
Value—2 to 4 moist, 3 to 6 dry
Chroma—0 to 2
Texture—silt loam or silty clay loam
Electrical conductivity (mmhos/cm)—4 to 8
Content of clay—18 to 35 percent
Content of sand—2 to 20 percent
Reaction—neutral to moderately alkaline

Cg horizon:
Hue—2.5Y, 5Y, or N
Value—2 to 5 moist, 3 to 7 dry
Chroma—0 to 2
Texture—silt loam or silty clay loam; silty clay loam, clay loam, or silty clay below a depth of 40 inches in some pedons; commonly stratified with loam or silt loam; loose sand and gravel are at a depth of 40 to 60 inches in some pedons
Content of clay—18 to 40 percent
Content of sand—2 to 10 percent
Reaction—neutral to moderately alkaline
Special features—crystals and nests of gypsum and other salts range widely in size and amount

Saltillo Series

The Saltillo series consists of very deep, poorly drained soils that formed in silty alluvium high in exchangeable sodium. These soils are on flood plains. Permeability is moderately slow. Slopes range from 0 to 2 percent. The mean annual temperature is 51 degrees F, and the mean annual precipitation is 28 inches.

Taxonomic classification: Fine-silty, mixed, superactive, calcareous, mesic Typic Halaquepts

Typical Pedon

Saltillo silt loam, on a nearly level slope, in an area of native pasture about 2 miles east and 0.5 mile north of Raymond, in Lancaster County, Nebraska; 2,600 feet south and 120 feet east of the northwest corner of sec. 34, T. 12 N., R. 6 E.; lat. 41 degrees N. and long. 96 degrees W. (Colors are for moist soil unless otherwise indicated.)

An—0 to 6 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; weak fine granular structure; electrical conductivity equivalent of 16.7; sodium adsorption ratio of 82; moderately alkaline; slight effervescence throughout; abrupt smooth boundary.

Bn—6 to 17 inches; dark gray (10YR 4/1) silt loam, grayish brown (10YR 5/2) dry; moderate medium subangular blocky structure parting to weak medium granular; electrical conductivity equivalent of 15.3; sodium adsorption ratio of 88; common medium rounded strong brown (7.5YR 5/6) soft masses of iron throughout; slight effervescence throughout; slightly alkaline; clear smooth boundary.

Anb1—17 to 32 inches; very dark gray (10YR 3/1) silty clay loam, dark grayish brown (10YR 4/2) dry; weak medium subangular blocky structure; electrical conductivity equivalent of 12; sodium adsorption ratio of 78; common medium rounded strong brown (7.5YR 5/6) soft masses of iron throughout; slight effervescence throughout; slightly alkaline; clear smooth boundary.

Anb2—32 to 50 inches; very dark gray (N 3/0) silty clay loam, dark grayish brown (2.5Y 4/2) dry; weak coarse subangular blocky structure; electrical conductivity equivalent of 10; sodium adsorption ratio of 82; common medium rounded strong brown (7.5YR 5/6) soft masses of iron throughout; slight effervescence throughout; slightly alkaline; gradual smooth boundary.

Anb3—50 to 60 inches; black (N 2/0) silty clay loam, gray (N 5/0) dry; weak coarse subangular blocky structure; electrical conductivity equivalent of 8; sodium adsorption ratio of 65; many medium rounded strong brown (7.5YR 5/6) soft masses of iron throughout; slight effervescence throughout; slightly alkaline; gradual smooth boundary.

Cn—60 to 80 inches; stratified very dark gray (N 3/0) and black (N 2/0) silt loam and silty clay loam, gray (N 5/0) dry; massive; electrical conductivity equivalent of 6; sodium adsorption ratio of 40; many medium rounded strong brown (7.5YR 5/6) soft masses of iron throughout; slight effervescence throughout; slightly alkaline.

Range in Characteristics

Soil moisture: The soil is wet in the control section from November through July and moist from August through October.
Mean annual soil temperature: 47 to 52 degrees F
Electrical conductivity (mmhos/cm)*:* 8 to 20; during seasons of above normal rainfall, conductivity may be less than 8.

Sodium adsorption ratio (SAR): More than 13 throughout
Depth to redoximorphic concentrations: 3 to 9 inches
Depth to episaturation: 0 to 18 inches from November through July

An horizon:
Hue—10YR or 2.5Y
Value—2 to 4 moist, 4 to 6 dry
Chroma—1 or 2
Texture—silt loam, silty clay loam, or loam
Sodium adsorption ratio (SAR)—13 to 90
Electrical conductivity (mmhos/cm)—4 to 20
Content of clay—15 to 30 percent
Content of sand—2 to 12 percent
Reaction—slightly alkaline or moderately alkaline

Bn horizon:
Hue—10YR or 2.5Y
Value—4 or 5 moist, 5 or 6 dry
Chroma—1 or 2
Texture—silt loam or silty clay loam
Sodium adsorption ratio (SAR)—13 to 90
Electrical conductivity (mmhos/cm)—4 to 20
Content of clay—18 to 40 percent
Content of sand—2 to 10 percent
Reaction—slightly alkaline or moderately alkaline

Anb and C horizons:
Hue—10YR, 2.5Y, or N
Value—2 to 4 moist, 3 to 6 dry
Chroma—0 to 2
Texture—silt loam, clay loam, or silty clay loam; thin layers of loam, clay loam, or silty clay or coarser textured material in some pedons
Sodium adsorption ratio (SAR)—13 to 90
Electrical conductivity (mmhos/cm)—4 to 20
Content of clay—18 to 40 percent
Content of sand—2 to 10 percent
Reaction—slightly alkaline to strongly alkaline
Special features—seams and nests of soluble salts in the upper part in some pedons; buried soils or dark layers of alluvium and stratification are common

Saltine Series

The Saltine series consists of very deep, somewhat poorly drained soils that formed in loamy alluvium high in exchangeable sodium. These soils are on flood plains. Permeability is moderately slow. Slopes range from 0 to 2 percent. The mean annual temperature is 51 degrees F, and the mean annual precipitation is 28 inches at the type location.

Taxonomic classification: Fine-silty, mixed, superactive, calcareous, mesic Typic Halaquepts

Typical Pedon

Saltine silty clay loam, on a nearly level slope, in a cultivated field about 1 mile north and 2.25 miles east of North Bend, in Dodge County, Nebraska; 800 feet west and 100 feet south of the northeast corner of sec. 4, T. 17 N., R. 6 E.; Malmo NW. USGS topographic quadrangle; lat. 41 degrees 28 minutes 51 seconds N. and long. 96 degrees 44 minutes 04 seconds W. (Colors are for dry soil unless otherwise indicated.)

Ap—0 to 7 inches; gray (10YR 5/1) silty clay loam, very dark grayish brown (10YR 3/2) moist; weak very fine granular structure; hard, friable; many fine and medium roots; many fine and medium pores; sodium adsorption ratio more than 13; strongly alkaline; abrupt smooth boundary.

Bw1—7 to 12 inches; grayish brown (2.5Y 5/2) silty clay loam, dark grayish brown (2.5Y 4/2) moist; strong fine and medium blocky structure; hard, firm, sticky; common fine and medium roots; common fine and medium pores; sodium adsorption ratio more than 13; slight effervescence; strongly alkaline; clear smooth boundary.

Bw2—12 to 30 inches; grayish brown (2.5Y 5/2) silty clay loam, dark grayish brown (2.5Y 4/2) moist; strong medium and coarse blocky structure; hard, firm, sticky; common fine roots; common fine pores; sodium adsorption ratio less than 13; violent effervescence; strongly alkaline; clear smooth boundary.

C1—30 to 48 inches; light brownish gray (2.5Y 6/2) silty clay loam, dark grayish brown (2.5Y 4/2) moist; few fine distinct yellowish brown (10YR 5/4) (moist) iron masses in the matrix; massive; hard, firm, sticky; few fine roots and tubular pores; sodium adsorption ratio less than 13; strong effervescence; very strongly alkaline; abrupt smooth boundary.

C2—48 to 55 inches; gray (10YR 5/1) silty clay loam, dark gray (10YR 4/1) moist; few distinct faint yellowish brown (10YR 5/4) (moist) mottles; massive; hard, firm, sticky; very strongly alkaline; clear smooth boundary.

C3—55 to 60 inches; gray (10YR 6/1) sandy clay loam, dark gray (10YR 4/1) moist; few fine distinct yellowish brown (10YR 5/4) (moist) iron masses in the matrix; massive; hard, firm, sticky; few fine roots; sodium adsorption ratio less than 13; very strongly alkaline.

Range in Characteristics

Soil moisture: The soil is wet in the control section from November through July and moist from August through October.
Mean annual soil temperature: 47 to 54 degrees F
Depth to calcium carbonate: 0 to 10 inches
Electrical conductivity (mmhos/cm)*:* 4 to 8; in some seasons conductivity is less than 4.
Sodium adsorption ratio (SAR): More than 13 above a depth of 20 inches; decreases below a depth of 20 inches
Depth to redoximorphic concentrations: 4 to 44 inches
Depth to episaturation: 18 to 36 inches from November through June
Thickness of the solum: 16 to 39 inches
Other feature: Some pedons do not have a Bw horizon.

A horizon:
Hue—10YR or 2.5Y
Value—4 to 6 dry, 2 to 5 moist
Chroma—1 or 2
Texture—silty clay loam, silt loam, loam, or clay loam
Sodium adsorption ratio (SAR)—less than 13
Electrical conductivity (mmhos/cm)—4 to 8; ranges up to 20
Content of clay—15 to 40 percent
Content of sand—2 to 52 percent
Reaction—slightly alkaline to very strongly alkaline

B horizon:
Hue—10YR or 2.5Y
Value—4 to 7 dry, 3 to 6 moist
Chroma—1 or 2
Texture—silt loam, silty clay loam, loam, clay loam, or silty clay
Sodium adsorption ratio (SAR)—more than 13 (upper part); less than 13 (lower part)
Electrical conductivity (mmhos/cm)—4 to 8
Content of clay—18 to 35 percent
Content of sand—2 to 10 percent
Reaction—strongly alkaline or very strongly alkaline

C horizon:
Hue—10YR or 2.5Y
Value—5 to 7 dry, 2 to 6 moist
Chroma—1 to 3
Texture—silt loam or silty clay loam; thin layers of loam, clay loam, or silty clay above a depth of 40 inches in some pedons; silty clay loam below a depth of 40 inches in some pedons (some pedons are finer or coarser textured)
Sodium adsorption ratio (SAR)—less than 13
Electrical conductivity (mmhos/cm)—4 to 20
Content of clay—18 to 40 percent
Content of sand—2 to 10 percent
Reaction—slightly alkaline to strongly alkaline
Special features—buried soils, or dark layers of alluvium and stratification common in this horizon; redoximorphic features typically absent or only faint in this horizon but prominent features are included in the range; seams and nests of soluble salts in the upper part of the horizon in some pedons

Scott Series

The Scott series consists of very deep, poorly drained and very poorly drained soils. These soils formed in loess. They are in depressions on uplands and stream terraces. Permeability is very slow. Slopes are 0 to 1 percent. The mean annual temperature is 55 degrees F, and the mean annual precipitation is 23 inches at the type location.

Taxonomic classification: Fine, smectitic, mesic Vertic Argialbolls

Typical Pedon

Scott silt loam, on a slope of less than 1 percent, in a pasture about 3 miles west and 2 miles south of Hildreth, in Franklin County, Nebraska; 1,600 feet east and 50 feet north of the southwest corner of sec. 14, T. 4 N., R. 16 W.; Hildreth USGS topographic quadrangle; lat. 40 degrees 18 minutes 26 seconds N. and long. 99 degrees 06 minutes 54 seconds W. (Colors are for dry soil unless otherwise indicated.)

A—0 to 5 inches; gray (10YR 5/1) silt loam, very dark gray (10YR 3/1) moist; moderate medium granular structure; slightly hard, friable; slightly acid; abrupt smooth boundary.
E—5 to 8 inches; gray (10YR 6/1) silt loam, gray (10YR 5/1) moist; moderate thin and medium platy structure parting to moderate fine subangular blocky; slightly hard, friable; slightly acid; abrupt smooth boundary.
Bt1—8 to 20 inches; dark gray (N 4/0) silty clay, very dark gray (N 3/0) moist; common medium prominent yellowish brown (10YR 5/4) iron masses; strong coarse prismatic structure parting to strong medium angular blocky; very hard, very firm; shiny surfaces on faces of most peds; many hard ferro-manganese pellets 1 to 2 mm in diameter; neutral; clear smooth boundary.
Bt2—20 to 34 inches; dark gray (N 4/0) clay, very dark gray (N 3/0) moist; few fine prominent yellowish

brown (10YR 5/4) iron masses; strong coarse prismatic structure parting to strong fine angular blocky; very hard, very firm; shiny surfaces on faces of most peds; many hard ferro-manganese pellets 1 to 2 mm in diameter; neutral; clear smooth boundary.

BC—34 to 46 inches; light brownish gray (2.5Y 6/2) silty clay loam, dark grayish brown (2.5Y 4/2) moist; moderate medium subangular blocky structure; hard, firm; neutral; gradual smooth boundary.

C1—46 to 56 inches; pale brown (10YR 6/3) silt loam, brown (10YR 4/3) moist; weak coarse prismatic structure; slightly hard, friable; slightly alkaline; gradual smooth boundary.

C2—56 to 60 inches; pale brown (10YR 6/3) silt loam, brown (10YR 4/3) moist; weak coarse prismatic structure; slightly hard, friable; violent effervescence; slightly alkaline.

Range in Characteristics

Soil moisture: The soil moisture control section is ponded or saturated to the surface from November through March. It ranges from saturated to the surface to intermittently dry in the surface layer but generally contains water at near saturation in the perched zone within the lower soil horizons from April through July. It is driest from August through October.

Depth to secondary calcium carbonates: 35 to 60 inches; carbonates below a depth of 60 inches in some pedons

Redoximorphic features: Directly beneath the albic horizon or at the top of the Bt horizon are many fine distinct soft yellowish brown (10YR 4/4) masses of iron accumulation and common hard dark brown (10YR 2/2) iron-manganese concretions 2 to 25 mm in diameter; in the BC horizon and the upper part of the C horizon are common medium reddish brown (5YR 5/4) to yellowish brown (10YR 5/6) iron masses; these iron masses become larger and less bright with increasing depth.

Thickness of the mollic epipedon: 19 to 46 inches

Thickness of the solum: 27 to more than 66 inches

Other features: Shiny faces on peds are less distinct in the lower part of the B horizon.

A horizon:
Hue—10YR
Value—3 to 5 dry, 2 or 3 moist
Chroma—1 or 2
Texture—silt loam or silty clay loam
Reaction—strongly acid to slightly acid

E horizon:
Hue—10YR
Value—5 or 6 dry, 4 or 5 moist
Chroma—1
Texture—silt loam or loam
Reaction—strongly acid to slightly acid

Bt horizon:
Hue—10YR, 2.5Y, 5Y, or N
Value—3 to 6 dry, 2 to 5 moist
Chroma—0 to 2
Texture—silty clay or clay; between 40 and 55 percent clay
Reaction—moderately acid to slightly alkaline

BC horizon:
Hue—10YR or 2.5Y
Value—4 to 6 dry, 3 or 4 moist
Chroma—2
Texture—silty clay loam, clay loam, or silt loam
Reaction—neutral to moderately alkaline

C horizon:
Hue—10YR or 2.5Y
Value—5 to 7 dry, 4 to 6 moist
Chroma—2 to 4
Texture—silt loam, clay loam, loam, or silty clay loam
Calcium carbonates—common soft to hard fine to coarse prominent white (10YR 8/1) calcium carbonate concentrations or mycelia-like filaments and coatings on cleavage planes in some pedons
Reaction—neutral to moderately alkaline

Steinauer Series

The Steinauer series consists of very deep, well drained soils that formed in calcareous glacial till. These soils are on uplands. Permeability is moderately slow. Slopes range from 5 to 60 percent. The mean annual temperature is about 52 degrees F, and the mean annual precipitation is about 28 inches.

Taxonomic classification: Fine-loamy, mixed, superactive, calcareous, mesic Typic Udorthents

Typical Pedon

Steinauer clay loam, on a convex, east-facing slope of 9 percent, in a pasture about 3 miles south and 0.5 mile west of Garland, in Seward County, Nebraska; 1,050 feet south and 2,375 feet west of the northeast corner of sec. 29, T. 11 N., R. 4 E.; Garland USGS topographic quadrangle; lat. 40 degrees 53 minutes 54 seconds N. and long. 96 degrees 59 minutes 42

seconds W. When this pedon was described, the soil was moist to a depth of 41 inches. (Colors are for moist soil unless otherwise indicated.)

Ap—0 to 6 inches; dark grayish brown (10YR 4/2) clay loam, grayish brown (10YR 5/2) dry; weak medium subangular blocky structure parting to weak medium granular; slightly hard, friable; common fine and medium roots; common fine and medium tubular pores; slight effervescence; slightly alkaline; abrupt smooth boundary.

AC—6 to 15 inches; gray (10YR 5/1) clay loam, light gray (10YR 6/1) dry; weak coarse and medium subangular blocky structure parting to moderate fine subangular blocky; hard, firm; common fine and medium roots; common fine and medium tubular pores; violent effervescence; moderately alkaline; clear smooth boundary.

C1—15 to 41 inches; grayish brown (10YR 5/2) clay loam, light brownish gray (10YR 6/2) dry; massive with common medium or strong angular planes of cleavage; hard, firm; few fine roots and tubular pores; many iron and manganese concretions; many fine and medium pockets or seams of soft lime; violent effervescence; many coarse prominent reddish brown (5YR 4/4) iron masses in the matrix which are relict redoximorphic features; moderately alkaline; diffuse smooth boundary.

C2—41 to 60 inches; yellowish brown (10YR 5/4) clay loam, light yellowish brown (10YR 6/4) dry; massive with many medium angular planes of cleavage; hard, firm; few fine roots and tubular pores; many iron and manganese concretions; common medium pockets or seams of soft lime; violent effervescence; moderately alkaline.

Range in Characteristics

Soil moisture regime: Udic
Mean annual soil temperature: 49 to 56 degrees F
Depth to secondary calcium carbonate: 0 to 10 inches
Thickness of the solum: 4 to 21 inches
Content of clay in the particle-size control section (weighted average): 24 to 35 percent
Content of sand in the particle-size control section (weighted average): 20 to 52 percent
Content of rock fragments in the particle-size control section (weighted average): 0 to 10 percent, by volume
Size of rock fragments in the particle-size control section: Gravel and cobbles
Kind of rock fragments in the particle-size control section: Mixed

A horizon:
Hue—10YR
Value—2 to 5 moist, 3 to 6 dry
Chroma—1 or 2
Texture—clay loam or loam
Content of clay—16 to 32 percent
Content of rock fragments—0 to 10 percent, by volume
Reaction—slightly alkaline or moderately alkaline

AC horizon (if it occurs):
Hue—10YR or 2.5Y
Value—4 or 5 moist, 5 or 6 dry
Chroma—1 to 4
Texture—clay loam or loam
Content of clay—24 to 35 percent
Reaction—slightly alkaline or moderately alkaline

C horizon:
Hue—10YR or 2.5Y
Value—5 or 6 moist, 6 or 7 dry
Chroma—2 to 4
Texture—clay loam or loam
Content of clay—24 to 35 percent
Content of rock fragments—0 to 10 percent gravel, cobbles, or stones, by volume
Reaction—slightly alkaline or moderately alkaline

Tomek Series

The Tomek series consists of very deep, well drained soils that formed in loess. These soils are on stream terraces. Permeability is moderately slow. Slopes range from 0 to 2 percent. The mean annual precipitation is about 28 inches, and the mean annual air temperature is about 51 degrees F at the type location.

Taxonomic classification: Fine, smectitic, mesic Pachic Argiudolls

Typical Pedon

Tomek silt loam, on a slope of 1 percent, on a nearly level plain, in an area of cropland about 4 miles north and 2 miles east of Wahoo, in Saunders County, Nebraska; 200 feet east and 425 feet north of the southwest corner of sec. 12, T. 15 N., R. 7 E. (Colors are for moist soil unless otherwise indicated.)

Ap1—0 to 5 inches; black (10YR 2/1) crushed silt loam, dark gray (10YR 4/1) dry; weak fine granular structure; soft, very friable; common fine and medium roots throughout; common fine and medium tubular pores; neutral (pH 6.6); abrupt smooth boundary.

Ap2—5 to 11 inches; black (10YR 2/1) crushed silt loam, dark gray (10YR 4/1) dry; weak thin platy structure parting to weak fine granular; slightly

hard, friable; common fine and medium roots throughout; common fine and medium tubular pores; neutral (pH 6.8); clear smooth boundary.

AB—11 to 19 inches; very dark gray (10YR 3/1) crushed silty clay loam; dark gray (10YR 4/1) dry; weak coarse subangular blocky structure parting to moderate medium granular; slightly hard, friable; common fine and medium roots throughout; common fine and medium tubular pores; neutral (pH 7.3); clear smooth boundary.

Bt1—19 to 26 inches; very dark grayish brown (10YR 3/2) crushed silty clay loam, dark grayish brown (10YR 4/2) dry; weak coarse prismatic structure parting to medium subangular blocky; hard, friable; common fine roots throughout; common fine tubular pores; slightly alkaline (pH 7.4); clear smooth boundary.

Bt2—26 to 31 inches; very dark grayish brown (10YR 3/2) crushed silty clay loam, grayish brown (10YR 5/2) dry; few fine prominent brown (7.5YR 4/4) soft masses of iron accumulation; moderate coarse prismatic structure parting to moderate medium subangular blocky; very hard, firm; few fine roots in cracks; common fine tubular pores; very few very dark gray (10YR 3/1) patchy organic coats and continuous clay films on vertical and horizontal faces of peds; few fine rounded soft masses of iron-manganese; neutral (pH 7.3); clear smooth boundary.

Bt3—31 to 46 inches; dark grayish brown (10YR 4/2) crushed silty clay loam, brown (10YR 5/3) dry; few fine prominent yellowish red (5YR 5/8), common medium prominent strong brown (7.5YR 4/6), soft masses of iron accumulation and distinct grayish brown (2.5Y 5/2) iron depletions; strong coarse prismatic structure parting to strong medium subangular blocky; very hard, very firm; very few very dark gray (10YR 3/1) patchy organic coats, and continuous clay films on faces of peds; many fine rounded soft masses of iron-manganese; neutral (pH 7.1); gradual smooth boundary.

Bt4—46 to 54 inches; brown (10YR 5/3) crushed silty clay loam, pale brown (10YR 6/3) dry; few fine prominent yellowish red (5YR 5/8), many medium prominent strong brown (7.5YR 4/6) soft masses of iron accumulation, and common medium distinct grayish brown (2.5Y 5/2) iron depletions; strong coarse prismatic structure parting to strong medium subangular blocky; very hard, firm; very few very dark gray (10YR 3/1) patchy organic coats on vertical faces of peds, and continuous clay films on faces of peds; many fine rounded soft masses of iron-manganese; neutral (pH 7.1); gradual smooth boundary.

BC—54 to 68 inches; brown (10YR 5/3) crushed silty clay loam, pale brown (10YR 6/3) dry; many medium prominent strong brown (7.5YR 4/6) soft masses of iron accumulation and distinct grayish brown (2.5Y 5/2) iron depletions; weak coarse prismatic structure parting to moderate medium subangular blocky; hard, firm; patchy clay films on vertical faces of peds; few fine rounded iron-manganese concretions; neutral (pH 7.3); gradual wavy boundary.

C—68 to 72 inches; yellowish brown (10YR 5/4) crushed silt loam, light yellowish brown (10YR 6/4) dry; common medium prominent strong brown (7.5YR 4/6) soft masses of iron accumulation and light brownish gray (2.5Y 6/2) iron depletions; massive; slightly hard, friable; few fine rounded iron-manganese concretions; slightly alkaline (pH 7.5).

Range in Characteristics

Soil moisture regime: Udic

Mean annual soil temperature: 48 to 50 degrees F

Depth to argillic horizon: 10 to 30 inches

Thickness of the mollic epipedon: 24 to 50 inches

Thickness of the solum: 50 to more than 72 inches

Other features: The redoximorphic features are relict and are not indicative of present drainage conditions.

A and AB horizons:

Hue—10YR
Value—2 or 3 moist, 3 or 4 dry
Chroma—1 or 2
Texture—silty clay loam or silt loam
Content of clay—24 to 35 percent
Content of sand—less than 10 percent
Reaction—slightly acid or neutral

Bt horizon:

Hue—10YR
Value—3 to 5 moist, 4 to 6 dry
Chroma—2 or 3
Texture—silty clay loam
Content of clay—35 to 40 percent (upper 20 inches); 27 to 35 percent (lower part)
Content of sand—less than 10 percent
Reaction—neutral or slightly alkaline

BC and C horizons:

Hue—10YR or 2.5Y
Value—4 to 7 moist, 5 to 8 dry
Chroma—3 or 4
Texture—silt loam or silty clay loam
Content of clay—24 to 35 percent
Content of sand—less than 12 percent
Reaction—neutral or slightly alkaline

Wann Series

The Wann series includes very deep, somewhat poorly drained soils that formed in stratified calcareous alluvium. These soils are on flood plains. Permeability is moderately rapid. Slopes range from 0 to 2 percent. The mean annual temperature is about 51 degrees F, and the mean annual precipitation is about 25 inches at the type location.

Taxonomic classification: Coarse-loamy, mixed, superactive, mesic Fluvaquentic Haplustolls

Typical Pedon

Wann fine sandy loam, on a slope of less than 1 percent, in a cultivated field about 10 miles north and 1 mile west of Shelby, in Polk County, Nebraska; 800 feet south and 100 feet east of the northwest corner of sec. 28, T. 16 N., R. 1 W.; Columbus SW. USGS topographic quadrangle; lat. 41 degrees 20 minutes 06 seconds N. and long. 97 degrees 26 minutes 40 seconds W. (Colors are for dry soil unless otherwise indicated.)

Ap—0 to 6 inches; dark gray (10YR 4/1) fine sandy loam, very dark gray (10YR 3/1) moist; weak medium granular structure; soft, very friable; many fine roots throughout; slightly alkaline; abrupt smooth boundary.

A—6 to 16 inches; gray (10YR 5/1) fine sandy loam, very dark gray (10YR 3/1) moist; weak coarse blocky structure parting to moderate medium granular; soft, friable; common fine roots throughout; strong effervescence; moderately alkaline; abrupt smooth boundary.

C—16 to 50 inches; light brownish gray (10YR 6/2) sandy loam, grayish brown (10YR 5/2) moist; with thin strata of gray (10YR 5/1) fine sandy loam, very dark gray (10YR 3/1) moist; common medium distinct yellowish brown (10YR 5/4) (moist) iron masses in the matrix; weak coarse prismatic structure; soft, friable; strong effervescence; moderately alkaline; clear wavy boundary.

Cg—50 to 60 inches; gray (10YR 6/1) sandy loam, dark gray (10YR 4/1) moist; single grain; loose; soft white masses of lime above a depth of 52 inches; strong effervescence; moderately alkaline.

Range in Characteristics

Soil moisture: The soil is moist in the solum from December through April and intermittently moist from May through December. July through September, the driest period, is within the intermittently moist period from May through December.

Depth to secondary carbonates: Some pedons contain carbonates at the surface and typically contain free carbonates throughout the control section.

Redoximorphic features: Typically occur in the C horizon; can occur in any part of the profile below the A horizon.

Depth to endosaturation: 1.5 feet in most wet years to 3.5 feet in most dry years

Thickness of the mollic epipedon: 8 to 20 inches

A horizon:
Hue—10YR
Value—4 or 5 dry, 2 or 3 moist
Chroma—1 to 3
Texture—fine sandy loam, loam, or sandy loam; silt loam to loamy sand in the upper 10 inches
Reaction—neutral to strongly alkaline

AC horizon (if it occurs):
Thickness—1 to 10 inches
Hue—10YR
Value—4 or 5 dry, 3 or 4 moist
Chroma—2 or 3
Texture—fine sandy loam, sandy loam, or loamy fine sand
Reaction—neutral to strongly alkaline

C and Cg horizons:
Hue—10YR or 2.5Y
Value—5 to 7 dry, 4 to 6 moist
Chroma—1 to 4
Texture—fine sandy loam or sandy loam; typically is coarser textured below a depth of 40 inches; thin strata of loam or loamy sand 1 to 3 inches thick common in the control section; sand, gravelly to gravelly coarse sand, or loam below a depth of 40 inches in some pedons
Reaction—neutral to strongly alkaline

Yutan Series

The Yutan series consists of very deep, well drained soils that formed in loess. These soils are on uplands and in a paleovalley. Permeability is moderately slow. Slopes range from 2 to 17 percent. The mean annual precipitation is about 29 inches, and the mean annual temperature is about 52 degrees F at the type location.

Taxonomic Classification: Fine-silty, mixed, superactive, mesic Mollic Hapludalfs

Typical Pedon

Yutan silty clay loam, on a convex, east-facing side slope of 7 percent, in an area of cropland about 4 miles south and 4 miles east of Swedeburg, in

Saunders County, Nebraska; 2,150 feet west and 150 feet north of the southeast corner of sec. 20, T. 13 N., R. 8 E. (Colors are for moist soil unless otherwise indicated.)

Ap—0 to 6 inches; very dark grayish brown (10YR 3/2) silty clay loam, grayish brown (10YR 5/2) dry; moderate fine granular structure; friable; many very fine and fine roots throughout; many very fine and fine tubular pores; slightly acid; abrupt smooth boundary.

Bt1—6 to 13 inches; brown (10YR 4/3) silty clay loam, pale brown (10YR 6/3) dry; moderate coarse prismatic structure parting to strong fine subangular blocky; firm; common very fine and fine roots throughout; common very fine and fine tubular pores; vertical krotovina with very dark grayish brown (10YR 3/2) material; many faint continuous clay films (cutans) on vertical and horizontal faces of peds; slightly acid; clear smooth boundary.

Bt2—13 to 20 inches; olive brown (2.5Y 4/3) silty clay loam, light yellowish brown (2.5Y 6/3) dry; few fine distinct dark yellowish brown (10YR 4/4) soft masses of iron accumulation; moderate coarse prismatic structure parting to strong medium subangular blocky; firm; common very fine and fine roots throughout; common very fine and fine tubular pores; vertical krotovina with very dark grayish brown (10YR 3/2) material; many faint continuous clay films (cutans) on vertical and horizontal faces of peds; few fine irregular soft masses of iron-manganese; neutral; clear smooth boundary.

Bt3—20 to 27 inches; olive brown (2.5Y 4/3) silty clay loam, light yellowish brown (2.5Y 6/3) dry; common fine distinct yellowish brown (10YR 5/6) soft masses of iron accumulation and few medium faint grayish brown (2.5Y 5/2) iron depletions; weak coarse prismatic structure parting to moderate medium subangular blocky; friable; few very fine roots throughout; few fine tubular pores; common faint continuous clay films (cutans) on vertical faces of peds; common fine and few medium irregular soft masses of iron-manganese; neutral; gradual smooth boundary.

Bt4—27 to 32 inches; olive brown (2.5Y 4/3) silty clay loam, light yellowish brown (2.5Y 6/3) dry; common fine distinct yellowish brown (10YR 5/6) soft masses of iron accumulation and few medium faint grayish brown (2.5Y 5/2) iron depletions; weak coarse prismatic structure parting to moderate medium subangular blocky; friable; few very fine roots throughout; few fine tubular pores; few faint discontinuous clay films (cutans) on vertical faces of peds; many fine irregular soft masses of iron-manganese; neutral; gradual smooth boundary.

BC—32 to 43 inches; grayish brown (2.5Y 5/2) silty clay loam, 50 percent light gray (2.5Y 7/2) and 50 percent light yellowish brown (2.5Y 6/3) dry; many coarse faint light brownish gray (2.5Y 6/2) and medium prominent strong brown (7.5YR 5/6) soft masses of iron accumulation; weak coarse prismatic structure parting to weak medium subangular blocky; friable; few very fine roots throughout; few fine tubular pores; few faint discontinuous pressure faces on vertical faces of peds; many fine irregular soft masses of iron-manganese; neutral; gradual smooth boundary.

C1—43 to 63 inches; grayish brown (2.5Y 5/2) silt loam, light gray (2.5Y 7/2) dry; many medium prominent reddish yellow (7.5YR 6/8) soft masses of iron accumulation; massive; friable; common fine tubular pores; many fine and medium irregular soft masses of iron-manganese; neutral; diffuse smooth boundary.

C2—63 to 80 inches; grayish brown (2.5Y 5/2) silt loam, light gray (2.5Y 7/2) dry; many medium prominent strong brown (7.5YR 5/8) soft masses of iron accumulation and common faint light brownish gray (2.5Y 6/2) iron depletions; massive; friable; common fine tubular pores; many fine and medium irregular soft masses of iron-manganese; slightly alkaline.

Range in Characteristics

Soil moisture regime: Udic
Mean annual soil temperature: 48 to 50 degrees F
Depth to argillic horizon: 10 to 30 inches
Content of clay in the particle-size control section (weighted average): 27 to 35 percent
Thickness of the mollic colors: Typically about 6 inches; between depths of 4 and 9 inches
Thickness of the solum: 18 to 60 inches
Reaction: Strongly acid to neutral
Other features: The redoximorphic features are relict and are not indicative of present drainage conditions. Redoximorphic features with hues of 7.5YR to 2.5Y are in the Bt horizon and generally increase in size and abundance through the BC and C horizons.

Ap horizon:
Hue—10YR
Value—2 or 3 moist, 4 or 5 dry
Chroma—2 or 3
Texture—silty clay loam
Content of clay—35 to 40 percent
Content of sand—less than 10 percent

Bt1 horizon:
Hue—10YR or 2.5Y
Value—3 to 5 moist, 5 to 7 dry
Chroma—2 to 4
Texture—silty clay loam or silty clay
Content of clay—33 to 42 percent
Content of sand—less than 10 percent

Bt2, Bt3, and Bt4 horizons (if they occur):
Hue—10YR or 2.5Y
Value—3 to 5 moist, 5 to 7 dry
Chroma—2 to 4
Texture—silty clay loam
Content of clay—27 to 35 percent
Content of sand—less than 10 percent

BC horizon:
Hue—10YR or 2.5Y
Value—4 or 5 moist, 6 or 7 dry
Chroma—2 to 4
Texture—silty clay loam or silt loam
Content of clay—24 to 33 percent
Content of sand—less than 12 percent

C horizon:
Hue—10YR or 2.5Y
Value—4 to 6 moist, 6 or 7 dry
Chroma—2 to 4
Texture—silt loam
Content of clay—20 to 27 percent
Content of sand—less than 15 percent

Formation of the Soils

This section describes how the factors of soil formation have affected the soils in Saunders County.

Soil is produced by soil-forming processes acting on deposited or accumulated geologic material. The characteristics of the soil at any given point are determined by the physical and mineralogical composition of the parent material; the climate under which the soil material has accumulated and existed since accumulation; the plant and animal life on and in the soil; the relief, or lay of the land; and the length of time the forces of soil formation have acted on the soil material.

Climate and plant and animal life, mainly plants, are the active factors of soil formation. These factors act on the parent material that has accumulated through the weathering of rocks and slowly change it to a natural body that has genetically related horizons. The effects of climate and animal and plant life are conditioned by relief. The parent material also influences the kind of soil profile that is formed and, in extreme cases, the parent material entirely determines the kind of soil that is formed.

Finally, time is needed to change the parent material into a soil profile. Some time is always required for differentiation of soil horizons. A long time is usually required for a soil profile to form distinct horizons.

The factors of soil formation are so closely interrelated in their effects on the soil that few generalizations can be made regarding the effect of any one factor unless conditions are specified for the other four. Many of the processes of soil development are unknown.

Parent Material

Parent material is the earth material from which a soil is formed, and it is largely responsible for the mineralogical composition of the soil. In Saunders County, the soils formed in seven kinds of parent material. In age of deposit from the oldest to the youngest, these parent materials are: sandstone, glacial till, lacustrine silt, glacial outwash, Loveland loess, Peorian loess, and alluvium (Condra and others, 1950).

Only a very small area of sandstone material is exposed in the southern part of the county. The sandstone is marked as rock outcrops within the map units of other soils. The Hedville soils developed from the sandstone material.

Glacial till is part of the upland landscape. Unoxidized till is generally grayish, but if it is exposed and weathered it becomes brownish. Till is a fine earth mixture of silt, sand, and clay studded with pebbles and occasionally with stones. Lime concretions of soft carbonate accumulation are common. In some places, this material contains small pockets of sand and gravel. Burchard, Pawnee, and Steinauer soils developed in material weathered from glacial till.

Malcolm soils formed in lake-deposited material. This material consists mainly of very fine sand or silt size particles. A few stones or boulders from adjacent, higher lying glacial till are on the surface. Only small areas of this lacustrine material are exposed.

Areas of reddish to brownish glacial outwash or reworked till are exposed throughout the upland areas and are associated with till. The soil that formed in this material ranges widely from clay to sand. Morrill soils formed in loamy sediment that contains many sand grains and a few pebbles. Malmo soils formed in clayey sediment that contains sand and pebbles.

Loveland loess is dark brown to yellowish red in this county. It is older than Peorian loess and is more oxidized. This material generally occupies ridges and is less than 10 feet thick. Deroin soils developed in Loveland loess. The acreage of this parent material is small in this county.

Peorian loess is the most extensive of the soil-forming materials in the county. This grayish to brownish silty clay loam material ranges from a few feet to about 20 to 25 feet in thickness. Aksarben, Fillmore, Tomek, Yutan, and Pohocco soils formed in material weathered from Peorian loess (fig. 8). These soils are generally in the uplands; however, they also formed in loess on stream terraces in the Todd Valley (fig. 9).

Alluvium is the unconsolidated clastic material deposited by running water. The alluvium on

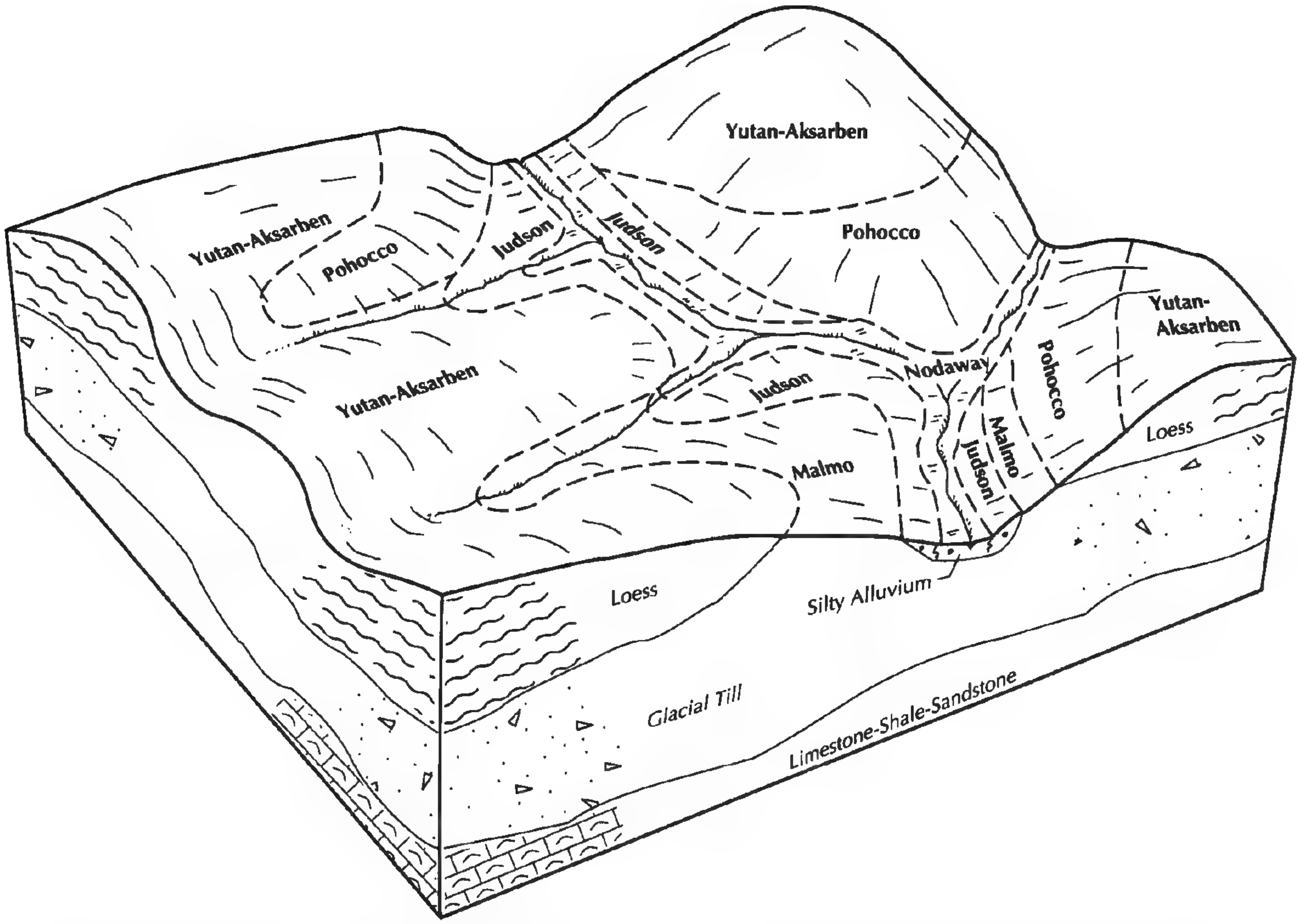

Figure 8.—Typical pattern of soils and parent material on uplands where the Yutan, Aksarben, and Pohocco soils are dominant.

footslopes or lower side slopes adjacent to steeper uplands consists of recent deep, friable material deposited by natural and/or man made water erosion from the adjoining uplands. It is generally silt loam or silty clay loam. Judson soils developed in this type of alluvial material. The recent alluvium of the valleys consists of silty, loamy, and clayey sediments washed from upland slopes and deposits from upstream and deposited on flood plains. Kenridge, Lamo, Nodaway, Gibbon, Alda, Platte, Obert, Barney, and Muscotah soils formed in this alluvial material (fig. 10). In most places, these soils are frequently or occasionally flooded and fresh deposits continue to accumulate.

Climate

Climate is an active factor in the formation of soils. Its influence is both direct and indirect. In the past, cold temperatures activated glaciers that left till material, and dry and windy periods produced eolian or dust particles that accumulated as loess deposits. At present, the movement of water received as rain influences the shape of the landscape, and alternate freezing and thawing of the soil hastens disintegration of parent material. Indirectly, climate affects the soils because it influences the amount and kind of vegetation and animal life living on them.

The continental climate of Saunders County has seasonal variations. The winter is moderately long and cold, and temperatures are commonly below 0 degrees F. Spring is cool, and there is considerable precipitation. Summer is warm, and temperatures are commonly higher than 95 degrees F. Thunderstorms are common during summer and late in spring. The fall season is mild, and there are occasional periods of rain. The average mean temperature is about 50 degrees F, and the annual precipitation is about 27 inches.

Enough precipitation enters the soil and moves through it to move the carbonates and other soluble

elements to a depth of at least 2 feet in most soils. Except for some of the steeper soils, most of the soils in Saunders County are slightly acid to strongly acid in the surface layer. The soils are somewhat leached, but they retain a high percentage of basic mineral elements.

Plant and Animal Life

Grass, trees, animals, micro-organisms, earthworms, humans, and other kinds of plants and animals live on or in the soil and are active in the soil-forming processes. The kinds of plants and animals present are determined by environmental factors that include climate, parent material, age of the soil, relief, and drainage.

Before the soils were cultivated, the dominant vegetation in Saunders County was mid and tall grasses. This kind of vegetation provides an abundance of organic matter that affects the physical and chemical properties of the soil and supplies the dark color to the surface layer. The fibrous roots of these grasses penetrate the soil, make it porous, and encourage development of the granular structures. The plant roots take up minerals in solution from the lower parts of the soil and eventually return them to the surface.

Micro-organisms, insects, earthworms, and burrowing rodents are beneficial to the soil structure, making the soil more fertile and more productive. Micro-organisms convert organic remains into a stable humus from which living plants obtain nutrients. Earthworms, insects, and small burrowing rodents make openings and channels in the soil and aerate, loosen, and mix it. Their remains add to the content of organic matter. Humans have had an influence on the thickness and amount of organic matter of the surface layer. Tillage practices, such as plowing and chiseling, have removed the protective vegetative cover. Resulting water erosion has removed most of the dark

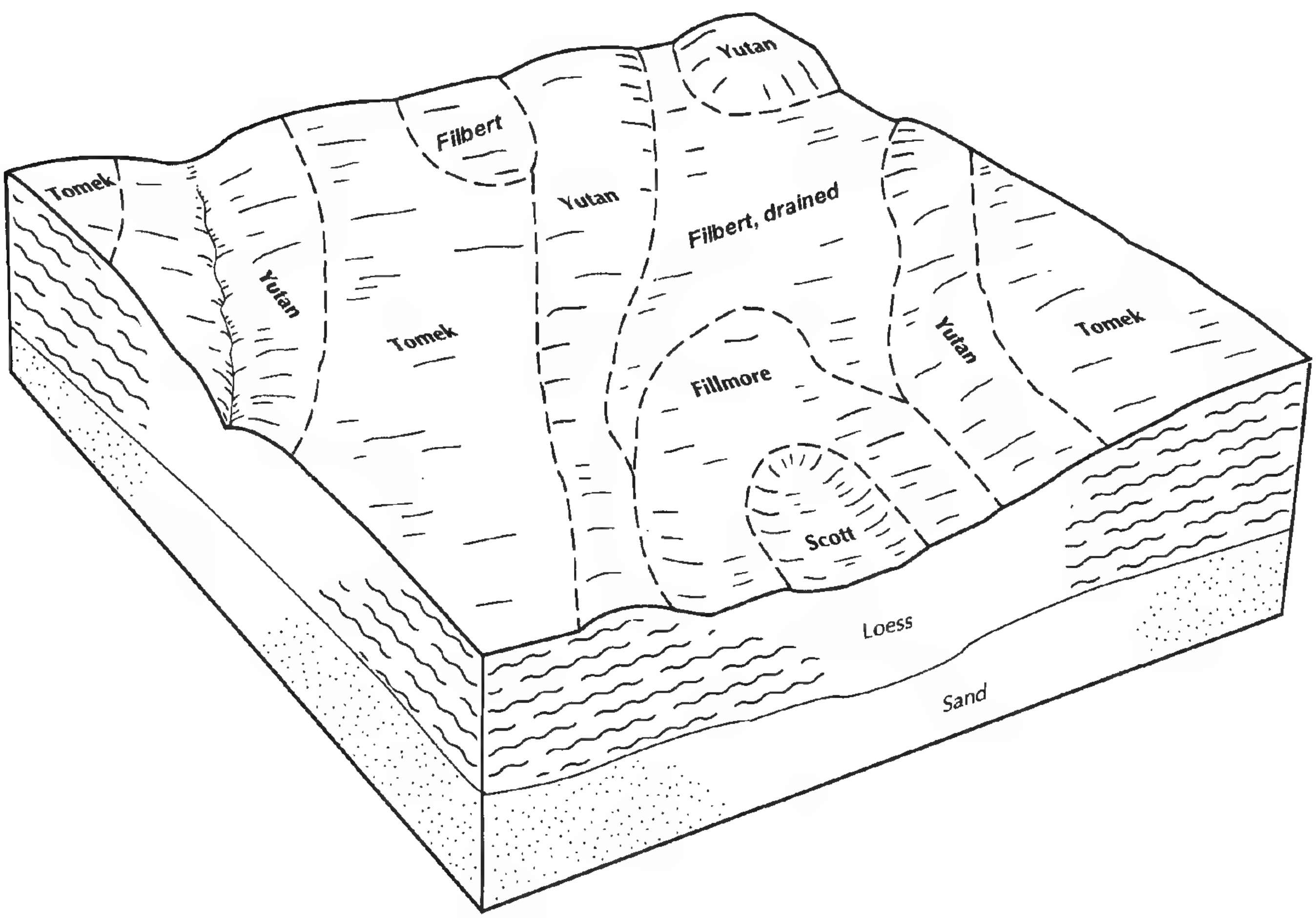

Figure 9.—Typical pattern of soils and parent material on a high stream terrace, also known as the Todd Valley, where the Yutan, Tomek, and Filbert soils are dominant.

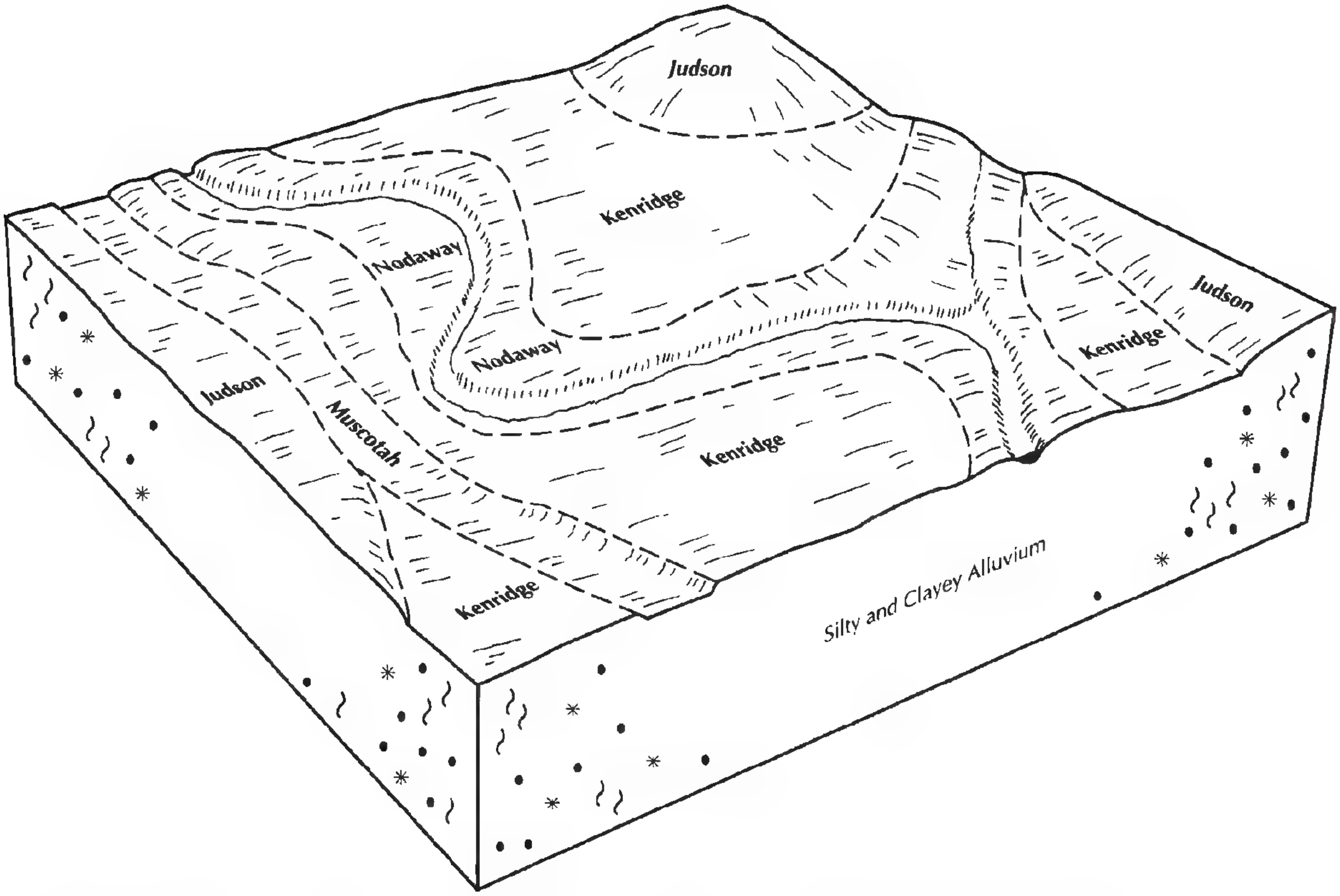

Figure 10.—Typical pattern of soils and parent material on a flood plain where the Nodaway, Kenridge, and Muscotah soils are dominant.

surface layer of the soil. Yutan and Pohocco soils are the product of human activities, which have removed the protective cover and allowed the soil to erode away.

Relief

Relief, or lay of the land, influences the formation of soil by affecting runoff, erosion, and drainage. Runoff is more rapid on steep and very steep slopes than on more gentle slopes. Less water penetrates the soil on areas that have rapid runoff, and absence of water reduces the amount of vegetation. Water can remove the soil almost as fast as it is formed. In Saunders County, the very steep Ida and Steinauer soils have little soil profile development other than a slightly darkened, thin surface layer.

Soils in slight depressional areas, such as the Filbert and Fillmore soils, collect run-in water and have characteristics that result from deep percolation of additional amounts of moisture. Clay colloids are leached to form a grayish subsurface layer and are then deposited as a dark, clayey subsoil. These claypan soils have very slow permeability.

Some of the nearly level soils on bottom land are somewhat poorly drained or poorly drained because they have low runoff or a moderately high water table. Muscotah and Obert soils are clayey and have low or very low runoff. A high water table can change the chemical composition of the nutrients in the parent material. The somewhat poorly drained Lamo soils are calcareous at the surface. The lime content is maintained by capillary action of moisture above the water table.

Time

The passage of time enables the factors of relief, climate, and plant and animal life to bring about the changes in parent material that result in the formation of soil. Generally, soils have to be in place for some time to develop genetic profiles and thick horizons. If

the parent material has been in place for only a short time, the soils are weakly developed because climate and vegetation have not been acting upon the soils for very long. Kenridge and Nodaway soils are weakly developed. These soils formed in recent alluvium deposited during the last few centuries. Some of these soils have formed during the last few years.

The Aksarben, Filbert, Fillmore, and Tomek soils developed in Peorian loess and have been in place long enough to have formed well defined, genetically related horizons. Pawnee soils, which formed in glacial till, also have well defined, genetically related horizons. However, because these soils have been developing for a shorter period of time than the soils formed in Peorian loess, they are less deeply leached of carbonates. The longer the parent material is exposed to soil development, the more nearly the soil reaches a balance with its environment.

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Glossary

ABC soil. A soil having an A, a B, and a C horizon.

AC soil. A soil having only an A and a C horizon. Commonly, such soil formed in recent alluvium or on steep, rocky slopes.

Aeration, soil. The exchange of air in soil with air from the atmosphere. The air in a well aerated soil is similar to that in the atmosphere; the air in a poorly aerated soil is considerably higher in carbon dioxide and lower in oxygen.

Aggregate, soil. Many fine particles held in a single mass or cluster. Natural soil aggregates, such as granules, blocks, or prisms, are called peds. Clods are aggregates produced by tillage or logging.

Alkali (sodic) soil. A soil having so high a degree of alkalinity (pH 8.5 or higher) or so high a percentage of exchangeable sodium (15 percent or more of the total exchangeable bases), or both, that plant growth is restricted.

Alluvium. Material, such as sand, silt, or clay, deposited on land by streams.

Animal unit month (AUM). The amount of forage required by one mature cow of approximately 1,000 pounds weight, with or without a calf, for 1 month.

Aquic conditions. Current soil wetness characterized by saturation, reduction, and redoximorphic features.

Argillic horizon. A subsoil horizon characterized by an accumulation of illuvial clay.

Aspect. The direction in which a slope faces.

Association, soil. A group of soils or miscellaneous areas geographically associated in a characteristic repeating pattern and defined and delineated as a single map unit.

Available water capacity (available moisture capacity). The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil. The capacity, in inches, in a 60-inch profile or to a limiting layer is expressed as:

Very low	0 to 3
Low	3 to 6
Moderate	6 to 9
High	9 to 12
Very high	more than 12

Backslope. The position that forms the steepest and generally linear, middle portion of a hillslope. In profile, backslopes are commonly bounded by a convex shoulder above and a concave footslope below.

Base saturation. The degree to which material having cation-exchange properties is saturated with exchangeable bases (sum of Ca, Mg, Na, and K), expressed as a percentage of the total cation-exchange capacity.

Base slope. A geomorphic component of hills consisting of the concave to linear (perpendicular to the contour) slope that, regardless of the lateral shape, forms an apron or wedge at the bottom of a hillside dominated by colluvium and slope-wash sediments (for example, slope alluvium).

Bedrock. The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface.

Bedrock-controlled topography. A landscape where the configuration and relief of the landforms are determined or strongly influenced by the underlying bedrock.

Boulders. Rock fragments larger than 2 feet (60 centimeters) in diameter.

Brush management. Use of mechanical, chemical, or biological methods to make conditions favorable for reseeding or to reduce or eliminate competition from woody vegetation and thus allow understory grasses and forbs to recover. Brush management increases forage production and thus reduces the hazard of erosion. It can improve the habitat for some species of wildlife.

Calcareous soil. A soil containing enough calcium carbonate (commonly combined with magnesium carbonate) to effervesce visibly when treated with cold, dilute hydrochloric acid.

Capillary water. Water held as a film around soil

particles and in tiny spaces between particles. Surface tension is the adhesive force that holds capillary water in the soil.

Cation. An ion carrying a positive charge of electricity. The common soil cations are calcium, potassium, magnesium, sodium, and hydrogen.

Cation-exchange capacity. The total amount of exchangeable cations that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. The term, as applied to soils, is synonymous with base-exchange capacity but is more precise in meaning.

Channery soil material. Soil material that has, by volume, 15 to 35 percent thin, flat fragments of sandstone, shale, slate, limestone, or schist as much as 6 inches (15 centimeters) along the longest axis. A single piece is called a channer.

Chemical treatment. Control of unwanted vegetation through the use of chemicals.

Chiseling. Tillage with an implement having one or more soil-penetrating points that shatter or loosen hard, compacted layers to a depth below normal plow depth.

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Clay depletions. Low-chroma zones having a low content of iron, manganese, and clay because of the chemical reduction of iron and manganese and the removal of iron, manganese, and clay. A type of redoximorphic depletion.

Clay film. A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels. Synonyms: clay coating, clay skin.

Claypan. A slowly permeable soil horizon that contains much more clay than the horizons above it. A claypan is commonly hard when dry and plastic or stiff when wet.

Climax plant community. The stabilized plant community on a particular site. The plant cover reproduces itself and does not change so long as the environment remains the same.

Coarse textured soil. Sand or loamy sand.

Cobble (or cobblestone). A rounded or partly rounded fragment of rock 3 to 10 inches (7.6 to 25 centimeters) in diameter.

Cobbly soil material. Material that has 15 to 35 percent, by volume, rounded or partially rounded rock fragments 3 to 10 inches (7.6 to 25 centimeters) in diameter. Very cobbly soil material has 35 to 60 percent of these rock fragments, and extremely cobbly soil material has more than 60 percent.

COLE (coefficient of linear extensibility). See Linear extensibility.

Colluvium. Soil material or rock fragments, or both, moved by creep, slide, or local wash and deposited at the base of steep slopes.

Complex slope. Irregular or variable slope. Planning or establishing terraces, diversions, and other water-control structures on a complex slope is difficult.

Complex, soil. A map unit of two or more kinds of soil or miscellaneous areas in such an intricate pattern or so small in area that it is not practical to map them separately at the selected scale of mapping. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas.

Concretions. Cemented bodies with crude internal symmetry organized around a point, a line, or a plane. They typically take the form of concentric layers visible to the naked eye. Calcium carbonate, iron oxide, and manganese oxide are common compounds making up concretions. If formed in place, concretions of iron oxide or manganese oxide are generally considered a type of redoximorphic concentration.

Conservation cropping system. Growing crops in combination with needed cultural and management practices. In a good conservation cropping system, the soil-improving crops and practices more than offset the effects of the soil-depleting crops and practices. Cropping systems are needed on all tilled soils. Soil-improving practices in a conservation cropping system include the use of rotations that contain grasses and legumes and the return of crop residue to the soil. Other practices include the use of green manure crops of grasses and legumes, proper tillage, adequate fertilization, and weed and pest control.

Conservation tillage. A tillage system that does not invert the soil and that leaves a protective amount of crop residue on the surface throughout the year.

Consistence, soil. Refers to the degree of cohesion and adhesion of soil material and its resistance to deformation when ruptured. Consistence includes resistance of soil material to rupture and to penetration; plasticity, toughness, and stickiness of puddled soil material; and the manner in which the soil material behaves when subject to compression. Terms describing consistence are defined in the "Soil Survey Manual."

Contour stripcropping. Growing crops in strips that

follow the contour. Strips of grass or close-growing crops are alternated with strips of clean-tilled crops or summer fallow.

Control section. The part of the soil on which classification is based. The thickness varies among different kinds of soil, but for many it is that part of the soil profile between depths of 10 inches and 40 or 80 inches.

Corrosion. Soil-induced electrochemical or chemical action that dissolves or weakens concrete or uncoated steel.

Cover crop. A close-growing crop grown primarily to improve and protect the soil between periods of regular crop production, or a crop grown between trees and vines in orchards and vineyards.

Cropping system. Growing crops according to a planned system of rotation and management practices.

Crop residue management. Returning crop residue to the soil, which helps to maintain soil structure, organic matter content, and fertility and helps to control erosion.

Decreasers. The most heavily grazed climax range plants. Because they are the most palatable, they are the first to be destroyed by overgrazing.

Deferred grazing. Postponing grazing or resting grazing land for a prescribed period.

Depth, soil. Generally, the thickness of the soil over bedrock. Very deep soils are more than 60 inches deep over bedrock; deep soils, 40 to 60 inches; moderately deep, 20 to 40 inches; shallow, 10 to 20 inches; and very shallow, less than 10 inches.

Diversion (or diversion terrace). A ridge of earth, generally a terrace, built to protect downslope areas by diverting runoff from its natural course.

Drainage class (natural). Refers to the frequency and duration of wet periods under conditions similar to those under which the soil formed. Alterations of the water regime by human activities, either through drainage or irrigation, are not a consideration unless they have significantly changed the morphology of the soil. Seven classes of natural soil drainage are recognized—*excessively drained, somewhat excessively drained, well drained, moderately well drained, somewhat poorly drained, poorly drained,* and *very poorly drained.* These classes are defined in the "Soil Survey Manual."

Drainage, surface. Runoff, or surface flow of water, from an area.

Ecological site. An area where climate, soil, and relief are sufficiently uniform to produce a distinct natural plant community. An ecological site is the product of all the environmental factors responsible for its development. It is typified by an association of species that differ from those on other ecological sites in kind and/or proportion of species or in total production.

Endosaturation. A type of saturation of the soil in which all horizons between the upper boundary of saturation and a depth of 2 meters are saturated.

Eolian soil material. Earthy parent material accumulated through wind action; commonly refers to sandy material in dunes or to loess in blankets on the surface.

Ephemeral stream. A stream, or reach of a stream, that flows only in direct response to precipitation. It receives no long-continued supply from melting snow or other source, and its channel is above the water table at all times.

Episaturation. A type of saturation indicating a perched water table in a soil in which saturated layers are underlain by one or more unsaturated layers within 2 meters of the surface.

Erosion. The wearing away of the land surface by water, wind, ice, or other geologic agents and by such processes as gravitational creep.

Erosion (geologic). Erosion caused by geologic processes acting over long geologic periods and resulting in the wearing away of mountains and the building up of such landscape features as flood plains and coastal plains. Synonym: natural erosion.

Erosion (accelerated). Erosion much more rapid than geologic erosion, mainly as a result of human or animal activities or of a catastrophe in nature, such as a fire, that exposes the surface.

Fallow. Cropland left idle in order to restore productivity through accumulation of moisture. Summer fallow is common in regions of limited rainfall where cereal grain is grown. The soil is tilled for at least one growing season for weed control and decomposition of plant residue.

Fertility, soil. The quality that enables a soil to provide plant nutrients, in adequate amounts and in proper balance, for the growth of specified plants when light, moisture, temperature, tilth, and other growth factors are favorable.

Field moisture capacity. The moisture content of a soil, expressed as a percentage of the ovendry weight, after the gravitational, or free, water has drained away; the field moisture content 2 or 3 days after a soaking rain; also called *normal field capacity, normal moisture capacity,* or *capillary capacity.*

Fine textured soil. Sandy clay, silty clay, or clay.

Firebreak. Area cleared of flammable material to stop or help control creeping or running fires. It also

serves as a line from which to work and to facilitate the movement of firefighters and equipment. Designated roads also serve as firebreaks.

Flaggy soil material. Material that has, by volume, 15 to 35 percent flagstones. Very flaggy soil material has 35 to 60 percent flagstones, and extremely flaggy soil material has more than 60 percent flagstones.

Flagstone. A thin fragment of sandstone, limestone, slate, shale, or (rarely) schist 6 to 15 inches (15 to 38 centimeters) long.

Flood plain. A nearly level alluvial plain that borders a stream and is subject to flooding unless protected artificially.

Fluvial. Of or pertaining to rivers; produced by river action, as a fluvial plain.

Footslope. The position that forms the inner, gently inclined surface at the base of a hillslope. In profile, footslopes are commonly concave. A footslope is a transition zone between upslope sites of erosion and transport (shoulders and backslopes) and downslope sites of deposition (toeslopes).

Forb. Any herbaceous plant not a grass or a sedge.

Genesis, soil. The mode of origin of the soil. Refers especially to the processes or soil-forming factors responsible for the formation of the solum, or true soil, from the unconsolidated parent material.

Gilgai. Commonly, a succession of microbasins and microknolls in nearly level areas or of microvalleys and microridges parallel with the slope. Typically, the microrelief of clayey soils that shrink and swell considerably with changes in moisture content.

Glacial drift. Pulverized and other rock material transported by glacial ice and then deposited. Also, the sorted and unsorted material deposited by streams flowing from glaciers.

Glacial outwash. Gravel, sand, and silt, commonly stratified, deposited by glacial meltwater.

Glacial till. Unsorted, nonstratified glacial drift consisting of clay, silt, sand, and boulders transported and deposited by glacial ice.

Glaciofluvial deposits. Material moved by glaciers and subsequently sorted and deposited by streams flowing from the melting ice. The deposits are stratified and occur as kames, eskers, deltas, and outwash plains.

Gleyed soil. Soil that formed under poor drainage, resulting in the reduction of iron and other elements in the profile and in gray colors.

Graded stripcropping. Growing crops in strips that grade toward a protected waterway.

Grassed waterway. A natural or constructed waterway, typically broad and shallow, seeded to grass as protection against erosion. Conducts surface water away from cropland.

Gravel. Rounded or angular fragments of rock as much as 3 inches (2 millimeters to 7.6 centimeters) in diameter. An individual piece is a pebble.

Gravelly soil material. Material that has 15 to 35 percent, by volume, rounded or angular rock fragments, not prominently flattened, as much as 3 inches (7.6 centimeters) in diameter.

Green manure crop (agronomy). A soil-improving crop grown to be plowed under in an early stage of maturity or soon after maturity.

Ground water. Water filling all the unblocked pores of the material below the water table.

Gully. A miniature valley with steep sides cut by running water and through which water ordinarily runs only after rainfall. The distinction between a gully and a rill is one of depth. A gully generally is an obstacle to farm machinery and is too deep to be obliterated by ordinary tillage; a rill is of lesser depth and can be smoothed over by ordinary tillage.

Hard bedrock. Bedrock that cannot be excavated except by blasting or by the use of special equipment that is not commonly used in construction.

Hardpan. A hardened or cemented soil horizon, or layer. The soil material is sandy, loamy, or clayey and is cemented by iron oxide, silica, calcium carbonate, or other substance.

Head slope. A geomorphic component of hills consisting of a laterally concave area of a hillside, especially at the head of a drainageway. The overland waterflow is converging.

High-residue crops. Such crops as small grain and corn used for grain. If properly managed, residue from these crops can be used to control erosion until the next crop in the rotation is established. These crops return large amounts of organic matter to the soil.

Hill. A natural elevation of the land surface, rising as much as 1,000 feet above surrounding lowlands, commonly of limited summit area and having a well defined outline; hillsides generally have slopes of more than 15 percent. The distinction between a hill and a mountain is arbitrary and is dependent on local usage.

Horizon, soil. A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. In the identification of soil horizons, an uppercase letter represents the major horizons. Numbers or

lowercase letters that follow represent subdivisions of the major horizons. An explanation of the subdivisions is given in the "Soil Survey Manual." The major horizons of mineral soil are as follows:

O horizon.—An organic layer of fresh and decaying plant residue.

A horizon.—The mineral horizon at or near the surface in which an accumulation of humified organic matter is mixed with the mineral material. Also, a plowed surface horizon, most of which was originally part of a B horizon.

E horizon.—The mineral horizon in which the main feature is loss of silicate clay, iron, aluminum, or some combination of these.

B horizon.—The mineral horizon below an A horizon. The B horizon is in part a layer of transition from the overlying A to the underlying C horizon. The B horizon also has distinctive characteristics, such as (1) accumulation of clay, sesquioxides, humus, or a combination of these; (2) prismatic or blocky structure; (3) redder or browner colors than those in the A horizon; or (4) a combination of these.

C horizon.—The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the overlying soil material. The material of a C horizon may be either like or unlike that in which the solum formed. If the material is known to differ from that in the solum, an Arabic numeral, commonly a 2, precedes the letter C.

Cr horizon.—Soft, consolidated bedrock beneath the soil.

R layer.—Consolidated bedrock beneath the soil. The bedrock commonly underlies a C horizon, but it can be directly below an A or a B horizon.

Humus. The well decomposed, more or less stable part of the organic matter in mineral soils.

Hydrologic soil groups. Refers to soils grouped according to their runoff potential. The soil properties that influence this potential are those that affect the minimum rate of water infiltration on a bare soil during periods after prolonged wetting when the soil is not frozen. These properties are depth to a seasonal high water table, the infiltration rate and permeability after prolonged wetting, and depth to a very slowly permeable layer. The slope and the kind of plant cover are not considered but are separate factors in predicting runoff.

Illuviation. The movement of soil material from one horizon to another in the soil profile. Generally, material is removed from an upper horizon and deposited in a lower horizon.

Impervious soil. A soil through which water, air, or roots penetrate slowly or not at all. No soil is absolutely impervious to air and water all the time.

Increasers. Species in the climax vegetation that increase in amount as the more desirable plants are reduced by close grazing. Increasers commonly are the shorter plants and the less palatable to livestock.

Infiltration. The downward entry of water into the immediate surface of soil or other material, as contrasted with percolation, which is movement of water through soil layers or material.

Infiltration capacity. The maximum rate at which water can infiltrate into a soil under a given set of conditions.

Infiltration rate. The rate at which water penetrates the surface of the soil at any given instant, usually expressed in inches per hour. The rate can be limited by the infiltration capacity of the soil or the rate at which water is applied at the surface.

Intake rate. The average rate of water entering the soil under irrigation. Most soils have a fast initial rate; the rate decreases with application time. Therefore, intake rate for design purposes is not a constant but is a variable depending on the net irrigation application. The rate of water intake, in inches per hour, is expressed as follows:

Less than 0.2	very low
0.2 to 0.4	low
0.4 to 0.75	moderately low
0.75 to 1.25	moderate
1.25 to 1.75	moderately high
1.75 to 2.5	high
More than 2.5	very high

Interfluve. An elevated area between two drainageways that sheds water to those drainageways.

Intermittent stream. A stream, or reach of a stream, that flows for prolonged periods only when it receives ground-water discharge or long, continued contributions from melting snow or other surface and shallow subsurface sources.

Invaders. On range, plants that encroach into an area and grow after the climax vegetation has been reduced by grazing. Generally, plants invade following disturbance of the surface.

Iron depletions. Low-chroma zones having a low content of iron and manganese oxide because of chemical reduction and removal, but having a clay content similar to that of the adjacent matrix. A type of redoximorphic depletion.

Irrigation. Application of water to soils to assist in production of crops. Methods of irrigation are:
Basin.—Water is applied rapidly to nearly level plains surrounded by levees or dikes.
Border.—Water is applied at the upper end of a strip in which the lateral flow of water is controlled by small earth ridges called border dikes, or borders.
Controlled flooding.—Water is released at intervals from closely spaced field ditches and distributed uniformly over the field.
Corrugation.—Water is applied to small, closely spaced furrows or ditches in fields of close-growing crops or in orchards so that it flows in only one direction.
Drip (or trickle).—Water is applied slowly and under low pressure to the surface of the soil or into the soil through such applicators as emitters, porous tubing, or perforated pipe.
Furrow.—Water is applied in small ditches made by cultivation implements. Furrows are used for tree and row crops.
Sprinkler.—Water is sprayed over the soil surface through pipes or nozzles from a pressure system.
Subirrigation.—Water is applied in open ditches or tile lines until the water table is raised enough to wet the soil.
Wild flooding.—Water, released at high points, is allowed to flow onto an area without controlled distribution.

Knoll. A small, low, rounded hill rising above adjacent landforms.

K_{sat}. Saturated hydraulic conductivity. (See Permeability.)

Leaching. The removal of soluble material from soil or other material by percolating water.

Linear extensibility. Refers to the change in length of an unconfined clod as moisture content is decreased from a moist to a dry state. Linear extensibility is used to determine the shrink-swell potential of soils. It is an expression of the volume change between the water content of the clod at $^1/_3$- or $^1/_{10}$-bar tension (33kPa or 10kPa tension) and oven dryness. Volume change is influenced by the amount and type of clay minerals in the soil. The volume change is the percent change for the whole soil. If it is expressed as a fraction, the resulting value is COLE, coefficient of linear extensibility.

Liquid limit. The moisture content at which the soil passes from a plastic to a liquid state.

Loam. Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

Loess. Fine grained material, dominantly of silt-sized particles, deposited by wind.

Low-residue crops. Such crops as corn used for silage, peas, beans, and potatoes. Residue from these crops is not adequate to control erosion until the next crop in the rotation is established. These crops return little organic matter to the soil.

Low strength. The soil is not strong enough to support loads.

Masses. Concentrations of substances in the soil matrix that do not have a clearly defined boundary with the surrounding soil material and cannot be removed as a discrete unit. Common compounds making up masses are calcium carbonate, gypsum or other soluble salts, iron oxide, and manganese oxide. Masses consisting of iron oxide or manganese oxide generally are considered a type of redoximorphic concentration.

Mechanical treatment. Use of mechanical equipment for seeding, brush management, and other management practices.

Medium textured soil. Very fine sandy loam, loam, silt loam, or silt.

Metamorphic rock. Rock of any origin altered in mineralogical composition, chemical composition, or structure by heat, pressure, and movement. Nearly all such rocks are crystalline.

Mineral soil. Soil that is mainly mineral material and low in organic material. Its bulk density is more than that of organic soil.

Minimum tillage. Only the tillage essential to crop production and prevention of soil damage.

Miscellaneous area. An area that has little or no natural soil and supports little or no vegetation.

Moderately coarse textured soil. Coarse sandy loam, sandy loam, or fine sandy loam.

Moderately fine textured soil. Clay loam, sandy clay loam, or silty clay loam.

Mollic epipedon. A thick, dark, humus-rich surface horizon (or horizons) that has high base saturation and pedogenic soil structure. It may include the upper part of the subsoil.

Moraine. An accumulation of earth, stones, and other debris deposited by a glacier. Some types are terminal, lateral, medial, and ground.

Morphology, soil. The physical makeup of the soil, including the texture, structure, porosity, consistence, color, and other physical, mineral, and biological properties of the various horizons, and the thickness and arrangement of those horizons in the soil profile.

Mottling, soil. Irregular spots of different colors that vary in number and size. Descriptive terms are as follows: abundance—*few, common,* and *many;*

size—*fine, medium,* and *coarse;* and contrast—*faint, distinct,* and *prominent.* The size measurements are of the diameter along the greatest dimension. *Fine* indicates less than 5 millimeters (about 0.2 inch); *medium,* from 5 to 15 millimeters (about 0.2 to 0.6 inch); and *coarse,* more than 15 millimeters (about 0.6 inch).

Mudstone. Sedimentary rock formed by induration of silt and clay in approximately equal amounts.

Munsell notation. A designation of color by degrees of three simple variables—hue, value, and chroma. For example, a notation of 10YR 6/4 is a color with hue of 10YR, value of 6, and chroma of 4.

Natric horizon. A special kind of argillic horizon that contains enough exchangeable sodium to have an adverse effect on the physical condition of the subsoil.

Neutral soil. A soil having a pH value of 6.6 to 7.3. (See Reaction, soil.)

Nodules. Cemented bodies lacking visible internal structure. Calcium carbonate, iron oxide, and manganese oxide are common compounds making up nodules. If formed in place, nodules of iron oxide or manganese oxide are considered types of redoximorphic concentrations.

Nose slope. A geomorphic component of hills consisting of the projecting end (laterally convex area) of a hillside. The overland waterflow is predominantly divergent.

Nutrient, plant. Any element taken in by a plant essential to its growth. Plant nutrients are mainly nitrogen, phosphorus, potassium, calcium, magnesium, sulfur, iron, manganese, copper, boron, and zinc obtained from the soil and carbon, hydrogen, and oxygen obtained from the air and water.

Organic matter. Plant and animal residue in the soil in various stages of decomposition. The content of organic matter in the surface layer is described as follows:

Very low	less than 0.5 percent
Low	0.5 to 1.0 percent
Moderately low	1.0 to 2.0 percent
Moderate	2.0 to 4.0 percent
High	4.0 to 8.0 percent
Very high	more than 8.0 percent

Pan. A compact, dense layer in a soil that impedes the movement of water and the growth of roots. For example, *hardpan, fragipan, claypan, plowpan,* and *traffic pan.*

Parent material. The unconsolidated organic and mineral material in which soil forms.

Ped. An individual natural soil aggregate, such as a granule, a prism, or a block.

Pedisediment. A thin layer of alluvial material that mantles an erosion surface and has been transported to its present position from higher lying areas of the erosion surface.

Pedon. The smallest volume that can be called "a soil." A pedon is three dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

Percolation. The movement of water through the soil.

Permeability. The quality of the soil that enables water or air to move downward through the profile. The rate at which a saturated soil transmits water is accepted as a measure of this quality. In soil physics, the rate is referred to as "saturated hydraulic conductivity," which is defined in the "Soil Survey Manual." In line with conventional usage in the engineering profession and with traditional usage in published soil surveys, this rate of flow continues to be expressed as "permeability." Terms describing permeability, measured in inches per hour, are as follows:

Extremely slow	0.0 to 0.01 inch
Very slow	0.01 to 0.06 inch
Slow	0.06 to 0.2 inch
Moderately slow	0.2 to 0.6 inch
Moderate	0.6 inch to 2.0 inches
Moderately rapid	2.0 to 6.0 inches
Rapid	6.0 to 20 inches
Very rapid	more than 20 inches

Phase, soil. A subdivision of a soil series based on features that affect its use and management, such as slope, stoniness, and flooding.

pH value. A numerical designation of acidity and alkalinity in soil. (See Reaction, soil.)

Plasticity index. The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.

Plastic limit. The moisture content at which a soil changes from semisolid to plastic.

Playa. The generally dry and nearly level plain that occupies the lowest parts of closed depressional areas. Temporary ponding occurs primarily in response to precipitation and runoff.

Plowpan. A compacted layer formed in the soil directly below the plowed layer.

Ponding. Standing water on soils in closed depressions. Unless the soils are artificially drained, the water can be removed only by percolation or evapotranspiration.

Poorly graded. Refers to a coarse grained soil or soil material consisting mainly of particles of nearly the same size. Because there is little difference in size of the particles, density can be increased only slightly by compaction.

Potential native plant community. See Climax plant community.

Potential rooting depth (effective rooting depth). Depth to which roots could penetrate if the content of moisture in the soil were adequate. The soil has no properties restricting the penetration of roots to this depth.

Prescribed burning. Deliberately burning an area for specific management purposes, under the appropriate conditions of weather and soil moisture and at the proper time of day.

Productivity, soil. The capability of a soil for producing a specified plant or sequence of plants under specific management.

Profile, soil. A vertical section of the soil extending through all its horizons and into the parent material.

Proper grazing use. Grazing at an intensity that maintains enough cover to protect the soil and maintain or improve the quantity and quality of the desirable vegetation. This practice increases the vigor and reproduction capacity of the key plants and promotes the accumulation of litter and mulch necessary to conserve soil and water.

Rangeland. Land on which the potential natural vegetation is predominantly grasses, grasslike plants, forbs, or shrubs suitable for grazing or browsing. It includes natural grasslands, savannas, many wetlands, some deserts, tundras, and areas that support certain forb and shrub communities.

Reaction, soil. A measure of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The degrees of acidity or alkalinity, expressed as pH values, are:

Ultra acid	less than 3.5
Extremely acid	3.5 to 4.4
Very strongly acid	4.5 to 5.0
Strongly acid	5.1 to 5.5
Moderately acid	5.6 to 6.0
Slightly acid	6.1 to 6.5
Neutral	6.6 to 7.3
Slightly alkaline	7.4 to 7.8
Moderately alkaline	7.9 to 8.4
Strongly alkaline	8.5 to 9.0
Very strongly alkaline	9.1 and higher

Redoximorphic concentrations. Nodules, concretions, soft masses, pore linings, and other features resulting from the accumulation of iron or manganese oxide. An indication of chemical reduction and oxidation resulting from saturation.

Redoximorphic depletions. Low-chroma zones from which iron and manganese oxide or a combination of iron and manganese oxide and clay has been removed. These zones are indications of the chemical reduction of iron resulting from saturation.

Redoximorphic features. Redoximorphic concentrations, redoximorphic depletions, reduced matrices, a positive reaction to alpha,alpha-dipyridyl, and other features indicating the chemical reduction and oxidation of iron and manganese compounds resulting from saturation.

Reduced matrix. A soil matrix that has low chroma in situ because of chemically reduced iron (Fe II). The chemical reduction results from nearly continuous wetness. The matrix undergoes a change in hue or chroma within 30 minutes after exposure to air as the iron is oxidized (Fe III). A type of redoximorphic feature.

Regolith. The unconsolidated mantle of weathered rock and soil material on the earth's surface; the loose earth material above the solid rock.

Relief. The elevations or inequalities of a land surface, considered collectively.

Residuum (residual soil material). Unconsolidated, weathered or partly weathered mineral material that accumulated as consolidated rock disintegrated in place.

Rill. A steep-sided channel resulting from accelerated erosion. A rill generally is a few inches deep and not wide enough to be an obstacle to farm machinery.

Road cut. A sloping surface produced by mechanical means during road construction. It is commonly on the uphill side of the road.

Rock fragments. Rock or mineral fragments having a diameter of 2 millimeters or more; for example, pebbles, cobbles, stones, and boulders.

Root zone. The part of the soil that can be penetrated by plant roots.

Runoff. The precipitation discharged into stream channels from an area. The water that flows off the surface of the land without sinking into the soil is called surface runoff. Water that enters the soil before reaching surface streams is called ground-water runoff or seepage flow from ground water.

Saline soil. A soil containing soluble salts in an amount that impairs growth of plants. A saline soil does not contain excess exchangeable sodium.

Sand. As a soil separate, individual rock or mineral

fragments from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.

Sandstone. Sedimentary rock containing dominantly sand-sized particles.

Saturation. Wetness characterized by zero or positive pressure of the soil water. Under conditions of saturation, the water will flow from the soil matrix into an unlined auger hole.

Scarification. The act of abrading, scratching, loosening, crushing, or modifying the surface to increase water absorption or to provide a more tillable soil.

Sedimentary rock. Rock made up of particles deposited from suspension in water. The chief kinds of sedimentary rock are conglomerate, formed from gravel; sandstone, formed from sand; shale, formed from clay; and limestone, formed from soft masses of calcium carbonate. There are many intermediate types. Some wind-deposited sand is consolidated into sandstone.

Series, soil. A group of soils that have profiles that are almost alike, except for differences in texture of the surface layer. All the soils of a series have horizons that are similar in composition, thickness, and arrangement.

Shale. Sedimentary rock formed by the hardening of a clay deposit.

Sheet erosion. The removal of a fairly uniform layer of soil material from the land surface by the action of rainfall and surface runoff.

Shoulder. The position that forms the uppermost inclined surface near the top of a hillslope. It is a transition from backslope to summit. The surface is dominantly convex in profile and erosional in origin.

Side slope. A geomorphic component of hills consisting of a laterally planar area of a hillside. The overland waterflow is predominantly parallel.

Silica. A combination of silicon and oxygen. The mineral form is called quartz.

Silt. As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a soil textural class, soil that is 80 percent or more silt and less than 12 percent clay.

Siltstone. Sedimentary rock made up of dominantly silt-sized particles.

Similar soils. Soils that share limits of diagnostic criteria, behave and perform in a similar manner, and have similar conservation needs or management requirements for the major land uses in the survey area.

Slickensides. Polished and grooved surfaces produced by one mass sliding past another. In soils, slickensides may occur at the bases of slip surfaces on the steeper slopes; on faces of blocks, prisms, and columns; and in swelling clayey soils, where there is marked change in moisture content.

Slick spot. A small area of soil having a puddled, crusted, or smooth surface and an excess of exchangeable sodium. The soil generally is silty or clayey, is slippery when wet, and is low in productivity.

Slope. The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance. In this survey, classes for simple slopes are as follows:

Nearly level	0 to 2 percent
Gently sloping	2 to 5 or 6 percent
Strongly sloping	5 or 6 to 11 or 12 percent
Moderately steep	11 or 12 to 17 or 18 percent
Steep	17 or 18 to 30 percent
Very steep	30 percent and higher

Sodic (alkali) soil. A soil having so high a degree of alkalinity (pH 8.5 or higher) or so high a percentage of exchangeable sodium (15 percent or more of the total exchangeable bases), or both, that plant growth is restricted.

Sodicity. The degree to which a soil is affected by exchangeable sodium. Sodicity is expressed as a sodium adsorption ratio (SAR) of a saturation extract, or the ratio of Na^+ to Ca^{++} + Mg^{++}. The degrees of sodicity and their respective ratios are:

Slight	less than 13:1
Moderate	13-30:1
Strong	more than 30:1

Sodium adsorption ratio (SAR). A measure of the amount of sodium (Na) relative to calcium (Ca) and magnesium (Mg) in the water extract from saturated soil paste. It is the ratio of the Na concentration divided by the square root of one-half of the Ca + Mg concentration.

Soft bedrock. Bedrock that can be excavated with trenching machines, backhoes, small rippers, and other equipment commonly used in construction.

Soil. A natural, three-dimensional body at the earth's surface. It is capable of supporting plants and has

properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief over periods of time.

Soil separates. Mineral particles less than 2 millimeters in equivalent diameter and ranging between specified size limits. The names and sizes, in millimeters, of separates recognized in the United States are as follows:

Very coarse sand	2.0 to 1.0
Coarse sand	1.0 to 0.5
Medium sand	0.5 to 0.25
Fine sand	0.25 to 0.10
Very fine sand	0.10 to 0.05
Silt	0.05 to 0.002
Clay	less than 0.002

Solum. The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in soil consists of the A, E, and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the material below the solum. The living roots and plant and animal activities are largely confined to the solum.

Stone line. A concentration of coarse fragments in a soil. Generally, it is indicative of an old weathered surface. In a cross section, the line may be one fragment or more thick. It generally overlies material that weathered in place and is overlain by recent sediment of variable thickness.

Stones. Rock fragments 10 to 24 inches (25 to 60 centimeters) in diameter if rounded or 15 to 24 inches (38 to 60 centimeters) in length if flat.

Stony. Refers to a soil containing stones in numbers that interfere with or prevent tillage.

Stripcropping. Growing crops in a systematic arrangement of strips or bands that provide vegetative barriers to wind erosion and water erosion.

Structure, soil. The arrangement of primary soil particles into compound particles or aggregates. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular*. *Structureless* soils are either *single grained* (each grain by itself, as in dune sand) or *massive* (the particles adhering without any regular cleavage, as in many hardpans).

Stubble mulch. Stubble or other crop residue left on the soil or partly worked into the soil. It protects the soil from wind erosion and water erosion after harvest, during preparation of a seedbed for the next crop, and during the early growing period of the new crop.

Subsoil. Technically, the B horizon; roughly, the part of the solum below plow depth.

Subsoiling. Tilling a soil below normal plow depth, ordinarily to shatter a hardpan or claypan.

Substratum. The part of the soil below the solum.

Subsurface layer. Any surface soil horizon (A, E, AB, or EB) below the surface layer.

Summer fallow. The tillage of uncropped land during the summer to control weeds and allow storage of moisture in the soil for the growth of a later crop. A practice common in semiarid regions, where annual precipitation is not enough to produce a crop every year. Summer fallow is frequently practiced before planting winter grain.

Summit. The topographically highest position of a hillslope. It has a nearly level (planar or only slightly convex) surface.

Surface layer. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from 4 to 10 inches (10 to 25 centimeters). Frequently designated as the "plow layer," or the "Ap horizon."

Surface soil. The A, E, AB, and EB horizons, considered collectively. It includes all subdivisions of these horizons.

Taxadjuncts. Soils that cannot be classified in a series recognized in the classification system. Such soils are named for a series they strongly resemble and are designated as taxadjuncts to that series because they differ in ways too small to be of consequence in interpreting their use and behavior. Soils are recognized as taxadjuncts only when one or more of their characteristics are slightly outside the range defined for the family of the series for which the soils are named.

Terrace. An embankment, or ridge, constructed across sloping soils on the contour or at a slight angle to the contour. The terrace intercepts surface runoff so that water soaks into the soil or flows slowly to a prepared outlet. A terrace in a field generally is built so that the field can be farmed. A terrace intended mainly for drainage has a deep channel that is maintained in permanent sod.

Terrace (geologic). An old alluvial plain, ordinarily flat or undulating, bordering a river, a lake, or the sea.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion

of fine particles, are *sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay,* and *clay*. The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or "very fine."

Tilth, soil. The physical condition of the soil as related to tillage, seedbed preparation, seedling emergence, and root penetration.

Toeslope. The position that forms the gently inclined surface at the base of a hillslope. Toeslopes in profile are commonly gentle and linear and are constructional surfaces forming the lower part of a hillslope continuum that grades to valley or closed-depression floors.

Topsoil. The upper part of the soil, which is the most favorable material for plant growth. It is ordinarily rich in organic matter and is used to topdress roadbanks, lawns, and land affected by mining.

Trace elements. Chemical elements, for example, zinc, cobalt, manganese, copper, and iron, in soils in extremely small amounts. They are essential to plant growth.

Upland. Land at a higher elevation, in general, than the alluvial plain or stream terrace; land above the lowlands along streams.

Weathering. All physical and chemical changes produced in rocks or other deposits at or near the earth's surface by atmospheric agents. These changes result in disintegration and decomposition of the material.

Well graded. Refers to soil material consisting of coarse grained particles that are well distributed over a wide range in size or diameter. Such soil normally can be easily increased in density and bearing properties by compaction. Contrasts with poorly graded soil.

Wilting point (or permanent wilting point). The moisture content of soil, on an ovendry basis, at which a plant (specifically a sunflower) wilts so much that it does not recover when placed in a humid, dark chamber.

Tables

Table 1.--Temperature and Precipitation

(Recorded in the period 1970-90 at Mead Agronomy Lab, Saunders County, Nebraska)

Month	Temperature					Precipitation					
	Average daily maximum	Average daily minimum	Average	2 years in 10 will have-- Maximum temperature higher than--	2 years in 10 will have-- Minimum temperature lower than--	Average number of growing degree days*	Average	2 yrs in 10 will have-- Less than	2 yrs in 10 will have-- More than	Average number of days with 0.10 inch or more	Average snowfall
	°F	°F	°F	°F	°F	Units	In	In	In	In	In
January	32.0	9.1	20.5	61	-21	4	0.40	0.11	0.70	1	3.9
February	36.8	14.3	25.5	70	-20	19	0.41	0.14	0.64	1	4.1
March	49.7	26.8	38.3	81	-4	107	1.85	0.47	2.96	3	2.7
April	64.0	38.6	51.3	91	16	351	2.62	1.22	3.82	5	.7
May	74.2	49.6	61.9	94	28	639	4.36	2.53	5.98	7	.0
June	85.0	59.4	72.2	102	41	967	3.18	1.80	4.40	5	.0
July	89.0	64.1	76.5	103	47	1,128	2.87	1.23	4.27	4	.0
August	86.0	61.3	73.6	101	43	1,037	3.58	1.32	5.46	5	.0
September	78.1	52.0	65.1	98	30	729	3.05	1.18	4.61	4	.0
October	65.6	38.9	52.2	89	19	362	2.52	0.88	4.09	4	.2
November	49.1	27.2	38.1	74	1	99	1.46	0.48	2.40	3	2.8
December	35.8	14.9	25.4	65	-16	9	0.71	0.23	1.16	1	4.8
Yearly:											
Average--	62.1	38.0	50.1	----	----	----	---	---	---	---	---
Extreme--	108	-35	---	104	-26	----	---	---	---	---	---
Total----	---	---	---	----	----	5,452	27.01	1.19	32.05	43	19.2

*A growing degree day is a unit of heat available for plant growth. It can be calculated by adding the maximum and minimum daily temperatures, dividing the sum by 2, and subtracting the temperature below which growth is minimal for the principal crops in the area (40 degrees F).

Table 2.--Freeze Dates in Spring and Fall

(Recorded in the period 1970-90 at Mead Agronomy Lab, Saunders County, Nebraska)

Probability	Temperature 24°F or lower	28°F or lower	32°F or lower
Last freezing temperature in spring:			
1 year in 10 later than--	Apr. 21	May 3	May 13
2 year in 10 later than--	Apr. 16	Apr. 28	May 9
5 year in 10 later than--	Apr. 7	Apr. 18	May 2
First freezing temperature in fall:			
1 yr in 10 earlier than--	Oct. 18	Sept. 28	Sept. 19
2 yr in 10 earlier than--	Oct. 22	Oct. 2	Sept. 23
5 yr in 10 earlier than--	Oct. 30	Oct. 9	Oct. 2

Table 3.--Growing Season

(Recorded in the period 1970-90 at Mead Agronomy Lab, Saunders County, Nebraska)

Probability	Daily minimum temperature during growing season: Higher than 24°F	Higher than 28°F	Higher than 32°F
	Days	Days	Days
9 years in 10	171	156	136
8 years in 10	177	162	142
5 years in 10	188	172	154
2 years in 10	200	182	166
1 year in 10	206	188	173

Table 4.--Acreage and Proportionate Extent of the Soils

Map symbol	Soil name	Acres	Percent
1050	Aksarben silty clay loam, 0 to 2 percent slopes	6,742	1.4
1100	Alda fine sandy loam, occasionally flooded	3,062	0.6
1347	Barney silty clay loam, wet, frequently flooded	2,632	0.5
1616	Boel loamy fine sand, occasionally flooded	1,622	0.3
1873	Burchard-Steinauer clay loams, 6 to 12 percent slopes, eroded	4,216	0.9
1879	Burchard-Steinauer clay loams, 12 to 18 percent slopes, eroded	5,468	1.1
2420	Deroin silty clay loam, 5 to 11 percent slopes, eroded	339	*
2830	Filbert silt loam, 0 to 1 percent slopes	21,810	4.5
2844	Fillmore silt loam, terrace, occasionally ponded	2,772	0.6
2863	Fluvaquents, silty, frequently flooded	582	0.1
3025	Gibbon silt loam, occasionally flooded	4,694	1.0
3038	Gibbon-Saltine loams, occasionally flooded	2,037	0.4
3421	Hedville cobbly loam, 6 to 30 percent slopes	87	*
3830	Ida-Steinauer complex, 17 to 60 percent slopes	6,801	1.4
3890	Inglewood loamy fine sand, rarely flooded	2,334	0.5
4104	Judson silt loam, 0 to 2 percent slopes	3,507	0.7
4106	Judson silt loam, 2 to 5 percent slopes	24,509	5.0
4250	Kenridge silty clay loam, occasionally flooded	15,606	3.2
4404	Lamo silty clay loam, occasionally flooded	3,268	0.7
4583	Lex loam, occasionally flooded	1,529	0.3
4853	Malcolm silt loam, 5 to 11 percent slopes, moderately eroded	186	*
4860	Malmo clay loam, 6 to 12 percent slopes, eroded	8,441	1.7
5388	Morrill clay loam, 6 to 12 percent slopes, moderately eroded	1,686	0.3
5480	Muscotah silty clay loam, occasionally flooded	6,106	1.3
5540	Nodaway silt loam, occasionally flooded	31,908	6.6
5541	Nodaway silt loam, channeled, frequently flooded	7,755	1.6
5736	Obert silty clay loam, wet, frequently flooded	1,290	0.3
5742	Obert silty clay loam, occasionally flooded	1,806	0.4
5780	Olmitz loam, 2 to 5 percent slopes	2,784	0.6
6046	Pawnee clay loam, 6 to 12 percent slopes, moderately eroded	2,145	0.4
6130	Platte fine sandy loam, occasionally flooded	3,160	0.7
6138	Platte-Barney complex, channeled, frequently flooded	2,605	0.5
6160	Pohocco silty clay loam, 5 to 11 percent slopes, eroded	12,968	2.7
6162	Pohocco silty clay loam, 11 to 17 percent slopes, eroded	16,208	3.3
6170	Pohocco-Pahuk complex, 5 to 11 percent slopes, eroded	6,506	1.3
6172	Pohocco-Pahuk complex, 11 to 17 percent slopes, eroded	1,084	0.2
6520	Saltillo silt loam, occasionally flooded	417	*
6791	Scott silt loam, terrace, frequently ponded	816	0.2
7069	Steinauer clay loam, 12 to 30 percent slopes	1,591	0.3
7290	Tomek silt loam, 0 to 2 percent slopes	33,427	6.9
7920	Wann fine sandy loam, occasionally flooded	4,598	0.9
8120	Yutan silty clay loam, 11 to 17 percent slopes, eroded	11,334	2.3
8124	Yutan silty clay loam, terrace, 2 to 5 percent slopes, eroded	34,409	7.1
8130	Yutan, eroded-Aksarben silty clay loams, 2 to 5 percent slopes	64,376	13.3
8134	Yutan, eroded-Judson complex, 5 to 11 percent slopes	106,773	22.0
9900	Arents, earthen dam	122	*
9985	Gravel pits	1,771	0.4
9998	Water	5,820	1.2
	Total	485,709	100.0

* Less than 0.1 percent.

Table 5.--Prime Farmland

(Only the soils considered prime farmland are listed. Urban or built-up areas of the soils listed are not considered prime farmland. If a soil is prime farmland only under certain conditions, the conditions are specified in parentheses after the soil name.)

Map symbol	Soil name
1050	Aksarben silty clay loam, 0 to 2 percent slopes
1100	Alda fine sandy loam, occasionally flooded (where drained)
2830	Filbert silt loam, 0 to 1 percent slopes (where drained)
3025	Gibbon silt loam, occasionally flooded (where drained)
4104	Judson silt loam, 0 to 2 percent slopes
4106	Judson silt loam, 2 to 5 percent slopes
4250	Kenridge silty clay loam, occasionally flooded
4404	Lamo silty clay loam, occasionally flooded (where drained)
4583	Lex loam, occasionally flooded (where drained)
5480	Muscotah silty clay loam, occasionally flooded (where drained)
5540	Nodaway silt loam, occasionally flooded
5780	Olmitz loam, 2 to 5 percent slopes
7290	Tomek silt loam, 0 to 2 percent slopes
7920	Wann fine sandy loam, occasionally flooded (where drained)
8124	Yutan silty clay loam, terrace, 2 to 5 percent slopes, eroded
8130	Yutan, eroded-Aksarben silty clay loams, 2 to 5 percent slopes

Table 6.--Land Capability and Yields per Acre of Crops

(Yields in the "N" columns are for nonirrigated areas; those in the "I" columns are for irrigated areas. Yields are those that can be expected under a high level of management. Absence of a yield indicates that the soil is not suited to the crop or the crop generally is not grown on the soil.)

Map symbol and soil name	Land capability		Corn		Grain sorghum		Soybeans	
	N	I	N	I	N	I	N	I
			Bu	Bu	Bu	Bu	Bu	Bu
1050:								
Aksarben----------------	1	1	115	155	90	---	46	56
1100:								
Alda, occasionally flooded---------------	3w	3w	81	144	70	95	---	---
1347:								
Barney, frequently flooded---------------	6w	---	---	---	---	---	---	---
1616:								
Boel, occasionally flooded---------------	4w	4w	40	80	35	---	---	---
1873:								
Burchard---------------	4e	---	80	130	80	120	29	43
Steinauer--------------	4e	---	75	120	70	110	27	41
1879:								
Burchard---------------	6e	---	65	---	70	---	25	---
Steinauer--------------	6e	---	60	---	65	---	23	---
2420:								
Deroin, severely eroded-	4e	4e	80	130	80	115	30	45
2830:								
Filbert----------------	2w	2w	105	125	67	---	---	---
2844:								
Fillmore---------------	3w	4w	50	45	55	---	---	---
2863:								
Fluvaquents------------	8w	---	---	---	---	---	---	---
3025:								
Gibbon, occasionally flooded---------------	2w	2w	110	140	85	---	34	39
3038:								
Gibbon, occasionally flooded---------------	2w	2w	110	140	85	---	34	39
Saltine, occasionally flooded---------------	6s	---	55	100	55	90	21	---
3421:								
Hedville---------------	6s	---	---	---	---	---	---	---
3830:								
Ida--------------------	7e	---	---	---	---	---	---	---
Steinauer--------------	7e	---	65	---	65	---	---	---

Table 6.--Land Capability and Yields per Acre of Crops--Continued

Map symbol and soil name	Land capability N	Land capability I	Corn N	Corn I	Grain sorghum N	Grain sorghum I	Soybeans N	Soybeans I
			Bu	Bu	Bu	Bu	Bu	Bu
3890: Inglewood, rarely flooded	4e	3e	25	100	30	---	---	---
4104: Judson	1	1	105	150	85	120	40	52
4106: Judson	2e	3e	105	150	85	120	40	52
4250: Kenridge, occasionally flooded	2w	2w	120	160	100	---	46	56
4404: Lamo, occasionally flooded	2w	2w	90	135	80	---	32	40
4583: Lex, occasionally flooded	3w	3w	70	130	75	---	---	---
4853: Malcolm	4e	4e	74	---	80	---	32	---
4860: Malmo, severely eroded	4e		72	127	74	105	27	42
5388: Morrill	4e	---	75	---	55	---	25	---
5480: Muscotah, occasionally flooded	2w	2w	95	150	100	135	40	50
5540: Nodaway, occasionally flooded	2w	2w	110	170	100	135	38	46
5541: Nodaway, channeled	6w	---	---	---	---	---	---	---
5736: Obert, frequently flooded	6w	---	---	---	---	---	---	---
5742: Obert, occasionally flooded	6w	---	---	---	---	---	---	---
5780: Olmitz	2e	3e	105	140	75	---	34	40
6046: Pawnee	4e	4e	80	130	80	115	30	45
6130: Platte, occasionally flooded	4w	4w	40	85	55	---	18	26

Table 6.--Land Capability and Yields per Acre of Crops--Continued

Map symbol and soil name	Land capability		Corn		Grain sorghum		Soybeans	
	N	I	N	I	N	I	N	I
			Bu	Bu	Bu	Bu	Bu	Bu
6138:								
Platte, frequently flooded----------------	6w	6w	40	85	55	---	18	26
Barney, frequently flooded, channeled-----	6w	---	---	---	---	---	---	---
6160:								
Pohocco-----------------	3e	4e	72	---	68	---	24	---
6162:								
Pohocco-----------------	4e	---	72	---	68	---	24	---
6170:								
Pohocco-----------------	3e	4e	72	---	68	---	24	---
Pahuk-------------------	6e	4e	50	---	45	---	---	---
6172:								
Pohocco-----------------	4e	---	72	---	68	---	24	---
Pahuk-------------------	6e	---	50	---	45	---	---	---
6520:								
Saltillo, occasionally flooded----------------	6s	---	35	---	---	---	---	---
6791:								
Scott-------------------	5w	---	---	---	---	---	---	---
7069:								
Steinauer---------------	6e	---	65	---	65	---	---	---
7290:								
Tomek-------------------	1	1	115	155	86	---	38	48
7920:								
Wann, occasionally flooded----------------	2w	2w	88	138	79	---	---	---
8120:								
Yutan-------------------	4e	---	90	110	80	---	30	34
8124:								
Yutan-------------------	2e	3e	90	110	80	---	30	34
8130:								
Yutan-------------------	2e	3e	90	110	80	---	30	34
Aksarben----------------	2e	3e	115	155	90	---	46	56
8134:								
Yutan-------------------	3e	4e	90	110	80	---	30	34
Judson------------------	3e	4e	105	150	85	120	40	52
9900:								
Arents, earthen dam-----	8	---	---	---	---	---		---

Table 6.--Land Capability and Yields per Acre of Crops--Continued

Map symbol and soil name	Land capability N	Land capability I	Corn N	Corn I	Grain sorghum N	Grain sorghum I	Soybeans N	Soybeans I
			Bu	Bu	Bu	Bu	Bu	Bu
9985:								
Gravel pits	8s	---	---	---	---	---	---	---
9998:								
Water.								

Table 7.--Acreage by Capability Class and Subclass

Capability class	Capability subclass	Acreage
Unclassified	---	5,820
1	---	43,844
2	e	136,577
2	w	91,007
3	e	110,613
3	w	9,394
4	e	45,183
4	w	4,440
5	w	2,639
6	e	10,289
6	w	15,870
6	s	1,198
7	e	6,121
8	---	122
8	w	812
8	s	1,780

Table 8.--Rangeland Productivity and Characteristic Plant Communities

(Only the soils that support rangeland vegetation suitable for grazing are listed.)

Map symbol and soil name	Ecological site	Total dry-weight production		
		Favorable year	Normal year	Unfavorable year
		Lb/acre	Lb/acre	Lb/acre
1050:				
Aksarben	Silty; Veg. Zone 4	4,500	4,000	3,500
1100:				
Alda, occasionally flooded	Subirrigated; Veg. Zone 4	5,900	5,500	5,100
1347:				
Barney, frequently flooded	Wetland; Veg. Zone 3	5,500	5,200	5,000
1616:				
Boel, occasionally flooded	Subirrigated; Veg. Zone 4	5,900	5,500	5,100
1873:				
Burchard	Silty; Veg. Zone 4	4,750	4,000	3,000
Steinauer	Limy Upland; Veg. Zone 4	4,000	3,000	2,500
1879:				
Burchard	Silty; Veg. Zone 4	4,750	4,000	3,000
Steinauer	Limy Upland; Veg. Zone 4	4,000	3,000	2,500
2420:				
Deroin, severely eroded	Silty; Veg. Zone 4	4,750	4,000	3,000
2830:				
Filbert	Clayey; Veg. Zone 4	4,500	4,100	3,700
2844:				
Fillmore	Clayey Overflow; Veg. Zone 4	3,800	3,300	2,800
3025:				
Gibbon, occasionally flooded	Subirrigated; Veg. Zone 4	6,300	5,900	5,500
3038:				
Gibbon, occasionally flooded	Subirrigated; Veg. Zone 4	6,300	5,900	5,500
Saltine, occasionally flooded	Saline Subirrigated; Veg. Zone 4	4,300	3,900	3,500
3421:				
Hedville	Shallow Sandy; Veg. Zone 4	2,500	2,000	1,500
3830:				
Ida	Thin Loess; Veg. Zone 4	3,500	3,300	3,000
Steinauer	Limy Upland; Veg. Zone 4	4,000	3,000	2,500
3890:				
Inglewood, rarely flooded	Sandy Lowland; Veg. Zone 4	4,300	3,500	2,700
4104:				
Judson	Silty; Veg. Zone 4	4,750	4,000	3,000
4106:				
Judson	Silty; Veg. Zone 4	4,750	4,000	3,000

Table 8.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production: Favorable year	Normal year	Unfavorable year
		Lb/acre	Lb/acre	Lb/acre
4250:				
Kenridge, occasionally flooded	Silty Lowland; Veg. Zone 4	4,000	3,500	2,700
4404:				
Lamo, occasionally flooded	Subirrigated; Veg. Zone 4	6,300	5,500	4,700
4583:				
Lex, occasionally flooded	Subirrigated; Veg. Zone 4	5,200	4,900	4,600
4853:				
Malcolm	Silty; Veg. Zone 4	4,400	3,900	3,500
4860:				
Malmo, severely eroded	Clayey; Veg. Zone 4	4,500	3,750	2,750
5388:				
Morrill	Silty; Veg. Zone 4	4,750	4,000	3,000
5480:				
Muscotah, occasionally flooded	Clayey Overflow; Veg. Zone 4	4,000	3,000	2,500
5540:				
Nodaway, occasionally flooded	Silty Overflow; Veg. Zone 4	4,000	3,300	2,750
5541:				
Nodaway, channeled	Silty Overflow; Veg. Zone 4	4,000	3,300	2,750
5736:				
Obert, frequently flooded	Wetland; Veg. Zone 4	6,500	6,000	5,500
5742:				
Obert, occasionally flooded	Wetland; Veg. Zone 4	6,300	5,700	5,200
5780:				
Olmitz	Silty; Veg. Zone 4	4,750	4,000	3,000
6046:				
Pawnee	Clayey; Veg. Zone 4	4,500	3,750	2,750
6130:				
Platte, occasionally flooded	Subirrigated; Veg. Zone 4	5,500	5,100	4,700
6138:				
Platte, frequently flooded	Subirrigated; Veg. Zone 4	5,500	5,100	4,700
Barney, frequently flooded, channeled	Wetland; Veg. Zone 3	5,500	5,200	5,000
6160:				
Pohocco	Silty; Veg. Zone 4	4,200	3,600	3,000
6162:				
Pohocco	Silty; Veg. Zone 4	4,200	3,600	3,000
6170:				
Pohocco	Silty; Veg. Zone 4	4,200	3,600	3,000
Pahuk	Sandy; Veg. Zone 4	4,000	3,200	2,500
6172:				
Pohocco	Silty; Veg. Zone 4	4,200	3,600	3,000
Pahuk	Sandy; Veg. Zone 4	4,000	3,200	2,500

Table 8.--Rangeland Productivity and Characteristic Plant Communities--Continued

Map symbol and soil name	Ecological site	Total dry-weight production		
		Favorable year	Normal year	Unfavorable year
		Lb/acre	Lb/acre	Lb/acre
6520:				
Saltillo, occasionally flooded	Saline Subirrigated; Veg. Zone 4	4,300	3,900	3,500
7069:				
Steinauer	Limy Upland; Veg. Zone 4	4,000	3,000	2,500
7290:				
Tomek	Silty; Veg. Zone 4	4,800	3,900	3,000
7920:				
Wann, occasionally flooded	Subirrigated; Veg. Zone 4	6,300	5,900	5,500
8120:				
Yutan	Silty; Veg. Zone 4	4,400	3,900	3,400
8124:				
Yutan	Silty; Veg. Zone 4	4,400	3,900	3,400
8130:				
Yutan	Silty; Veg. Zone 4	4,400	3,900	3,400
Aksarben	Silty; Veg. Zone 4	4,500	4,000	3,500
8134:				
Yutan	Silty; Veg. Zone 4	4,400	3,900	3,400
Judson	Silty; Veg. Zone 4	4,750	4,000	3,000

Table 9.--Windbreaks and Environmental Plantings

(Absence of an entry indicates that trees generally do not grow to the given height.)

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of-- <8	8-15	16-25	26-35	>35
1050:					
Aksarben	American plum, common lilac, forsythia, gray dogwood, Nanking cherry, Peking cotoneaster, redosier dogwood	Amur maple, autumn olive, common chokecherry, Siberian peashrub, silver buffaloberry	Blue spruce, boxelder, bur oak, common hackberry, eastern redcedar	Austrian pine, green ash, pin oak, ponderosa pine, silver maple	Siberian elm
1100:					
Alda, occasionally flooded	American plum, blackhaw, fragrant sumac, Siberian peashrub, silver buffaloberry, skunkbush sumac	Common chokecherry, fragrant sumac	Common hackberry, eastern redbud, eastern redcedar, Manchurian crabapple, ponderosa pine, Russian olive	American sycamore, black locust, golden willow, green ash, honeylocust, red mulberry	Eastern cottonwood
1347:					
Barney, frequently flooded.					
1616:					
Boel, occasionally flooded	American plum, blackhaw, fragrant sumac, Siberian peashrub, silver buffaloberry, skunkbush sumac	Common chokecherry, fragrant sumac	Common hackberry, eastern redbud, eastern redcedar, Manchurian crabapple, ponderosa pine, Russian olive	American sycamore, black locust, golden willow, green ash, honeylocust, red mulberry	Eastern cottonwood
1873:					
Burchard	Forsythia, gray dogwood, hazelnut, Peking cotoneaster, redosier dogwood	American plum, amur honeysuckle, autumn olive, fragrant sumac, silver buffaloberry, skunkbush sumac	Black walnut, blue spruce, bur oak, eastern redcedar, green ash, Russian olive	American basswood, Austrian pine, black locust, honeylocust, ponderosa pine, Scotch pine, silver maple	---
Steinauer	American plum, fragrant sumac, silver buffaloberry, skunkbush sumac	---	Black locust, bur oak, eastern redcedar, green ash, honeylocust, ponderosa pine	Siberian elm	---
1879:					
Burchard	Forsythia, gray dogwood, hazelnut, Peking cotoneaster, redosier dogwood	American plum, amur honeysuckle, autumn olive, fragrant sumac, silver buffaloberry, skunkbush sumac	Black walnut, blue spruce, bur oak, eastern redcedar, green ash, Russian olive	American basswood, Austrian pine, black locust, honeylocust, ponderosa pine, Scotch pine, silver maple	---
Steinauer	American plum, fragrant sumac, silver buffaloberry, skunkbush sumac	---	Black locust, bur oak, eastern redcedar, green ash, honeylocust, ponderosa pine	Siberian elm	---

Table 9.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of-- <8	8-15	16-25	26-35	>35
2420:					
Deroin, severely eroded	Forsythia, gray dogwood, hazelnut, Peking cotoneaster, redosier dogwood	American plum, amur honeysuckle, autumn olive, fragrant sumac, silver buffaloberry, skunkbush sumac	Black walnut, blue spruce, bur oak, eastern redcedar, green ash, Russian olive	American basswood, Austrian pine, black locust, honeylocust, ponderosa pine, Scotch pine, silver maple	---
2830:					
Filbert	American plum, cotoneaster, forsythia, fragrant sumac, gray dogwood	Amur honeysuckle, amur maple, autumn olive, common chokecherry, skunkbush sumac	Blue spruce, boxelder, eastern redcedar, red mulberry, Russian olive	American sycamore, Austrian pine, black walnut, green ash, honeylocust, Norway maple, pin oak, Scotch pine	Eastern cottonwood, Siberian elm, silver maple
2844:					
Fillmore	American plum, cotoneaster, forsythia, fragrant sumac, gray dogwood	Amur honeysuckle, amur maple, autumn olive, common chokecherry, skunkbush sumac	Blue spruce, boxelder, eastern redcedar, red mulberry, Russian olive	American sycamore, Austrian pine, black walnut, green ash, honeylocust, Norway maple, pin oak, Scotch pine	Eastern cottonwood, Siberian elm, silver maple
2863:					
Fluvaquents.					
3025:					
Gibbon, occasionally flooded	American plum, blackhaw, fragrant sumac, Siberian peashrub, silver buffaloberry, skunkbush sumac	Common chokecherry, fragrant sumac	Common hackberry, eastern redbud, eastern redcedar, Manchurian crabapple, ponderosa pine, Russian olive	American sycamore, black locust, golden willow, green ash, honeylocust, red mulberry	Eastern cottonwood
3038:					
Gibbon, occasionally flooded	American plum, blackhaw, fragrant sumac, Siberian peashrub, silver buffaloberry, skunkbush sumac	Common chokecherry, fragrant sumac	Common hackberry, eastern redbud, eastern redcedar, Manchurian crabapple, ponderosa pine, Russian olive	American sycamore, black locust, golden willow, green ash, honeylocust, red mulberry	Eastern cottonwood
Saltine, occasionally flooded	Common lilac, Siberian peashrub, silver buffaloberry, skunkbush sumac	Eastern redcedar	Golden willow, green ash, Russian olive, Siberian elm	---	Eastern cottonwood
3421:					
Hedville.					
3830:					
Ida.					
Steinauer.					

Table 9.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of-- <8	8-15	16-25	26-35	>35
3890: Inglewood, rarely flooded	American plum, common chokecherry, common lilac, forsythia, Peking cotoneaster, skunkbush sumac	Amur maple, amur privet, autumn olive, common winterberry, silver buffaloberry, skunkbush sumac	Blue spruce, bur oak, eastern redcedar, Manchurian crabapple, red mulberry, Russian olive	Common hackberry, green ash, honeylocust, jack pine, ponderosa pine, Scotch pine	American sycamore
4104: Judson	Forsythia, gray dogwood, hazelnut, Peking cotoneaster, redosier dogwood	American plum, amur honeysuckle, autumn olive, fragrant sumac, silver buffaloberry, skunkbush sumac	Black walnut, blue spruce, bur oak, eastern redcedar, green ash, Russian olive	American basswood, Austrian pine, black locust, honeylocust, ponderosa pine, Scotch pine, silver maple	---
4106: Judson	Forsythia, gray dogwood, hazelnut, Peking cotoneaster, redosier dogwood	American plum, amur honeysuckle, autumn olive, fragrant sumac, silver buffaloberry, skunkbush sumac	Black walnut, blue spruce, bur oak, eastern redcedar, green ash, Russian olive	American basswood, Austrian pine, black locust, honeylocust, ponderosa pine, Scotch pine, silver maple	---
4250: Kenridge, occasionally flooded	Forsythia, fragrant sumac, gray dogwood, hazelnut, Peking cotoneaster, skunkbush sumac	American plum, amur honeysuckle, amur maple, autumn olive, common chokecherry, Nanking cherry	Boxelder, eastern redbud, eastern redcedar, red mulberry, Russian olive, Washington hawthorn	Austrian pine, black walnut, common hackberry, golden willow, green ash, honeylocust, pin oak, ponderosa pine, Scotch pine	Eastern cottonwood, silver maple
4404: Lamo, occasionally flooded	American plum, blackhaw, fragrant sumac, Siberian peashrub, silver buffaloberry, skunkbush sumac	Common chokecherry, fragrant sumac	Common hackberry, eastern redbud, eastern redcedar, Manchurian crabapple, ponderosa pine, Russian olive	American sycamore, black locust, golden willow, green ash, honeylocust, red mulberry	Eastern cottonwood
4583: Lex, occasionally flooded	American plum, blackhaw, fragrant sumac, Siberian peashrub, silver buffaloberry, skunkbush sumac	Common chokecherry, fragrant sumac	Common hackberry, eastern redbud, eastern redcedar, Manchurian crabapple, ponderosa pine, Russian olive	American sycamore, black locust, golden willow, green ash, honeylocust, red mulberry	Eastern cottonwood
4853: Malcolm	American plum, common lilac, forsythia, gray dogwood, Nanking cherry, Peking cotoneaster, redosier dogwood	Amur maple, autumn olive, common chokecherry, Siberian peashrub, silver buffaloberry	Blue spruce, boxelder, bur oak, common hackberry, eastern redcedar	Austrian pine, green ash, pin oak, ponderosa pine, silver maple	Siberian elm

Table 9.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
4860:					
Malmo, severely eroded--	American plum, amur honeysuckle, fragrant sumac, Peking cotoneaster, Siberian peashrub, skunkbush sumac	Autumn olive, common chokecherry, common winterberry, eastern redcedar, Manchurian crabapple	Austrian pine, black locust, blue spruce, green ash, honeylocust, ponderosa pine, Russian olive, Scotch pine	Siberian elm	---
5388:					
Morrill-----------------	Forsythia, gray dogwood, hazelnut, Peking cotoneaster, redosier dogwood	American plum, amur honeysuckle, autumn olive, fragrant sumac, silver buffaloberry, skunkbush sumac	Black walnut, blue spruce, bur oak, eastern redcedar, green ash, Russian olive	American basswood, Austrian pine, black locust, honeylocust, ponderosa pine, Scotch pine, silver maple	---
5480:					
Muscotah, occasionally flooded---------------	American plum, cotoneaster, forsythia, fragrant sumac, gray dogwood	Amur honeysuckle, amur maple, autumn olive, common chokecherry, skunkbush sumac	Blue spruce, boxelder, eastern redcedar, red mulberry, Russian olive	American sycamore, Austrian pine, black walnut, green ash, honeylocust, Norway maple, pin oak, Scotch pine	Eastern cottonwood, Siberian elm, silver maple
5540:					
Nodaway, occasionally flooded---------------	Cotoneaster, forsythia, fragrant sumac, gray dogwood	American plum, amur honeysuckle, autumn olive, common chokecherry	Boxelder, eastern redcedar, red mulberry, Russian olive	Austrian pine, black walnut, blue spruce, green ash, honeylocust, Norway maple, pin oak, Scotch pine	American sycamore, eastern cottonwood, Siberian elm, silver maple
5541:					
Nodaway, channeled.					
5736:					
Obert, frequently flooded.					
5742:					
Obert, occasionally flooded---------------	American plum, cotoneaster, forsythia, fragrant sumac, gray dogwood	Amur honeysuckle, amur maple, autumn olive, common chokecherry, skunkbush sumac	Blue spruce, boxelder, eastern redcedar, red mulberry, Russian olive	American sycamore, Austrian pine, black walnut, green ash, honeylocust, Norway maple, pin oak, Scotch pine	Eastern cottonwood, Siberian elm, silver maple
5780:					
Olmitz-----------------	Forsythia, gray dogwood, hazelnut, Peking cotoneaster, redosier dogwood	American plum, amur honeysuckle, autumn olive, fragrant sumac, silver buffaloberry, skunkbush sumac	Black walnut, blue spruce, bur oak, eastern redcedar, green ash, Russian olive	American basswood, Austrian pine, black locust, honeylocust, ponderosa pine, Scotch pine, silver maple	---

Table 9.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of-- <8	8-15	16-25	26-35	>35
6045:					
Pawnee	American plum, amur honeysuckle, fragrant sumac, Peking cotoneaster, Siberian peashrub, skunkbush sumac	Autumn olive, common chokecherry, common winterberry, eastern redcedar, Manchurian crabapple	Austrian pine, black locust, blue spruce, green ash, honeylocust, ponderosa pine, Russian olive, Scotch pine	Siberian elm	---
6130:					
Platte, occasionally flooded	American plum, blackhaw, fragrant sumac, Siberian peashrub, silver buffaloberry, skunkbush sumac	Common chokecherry, fragrant sumac	Common hackberry, eastern redbud, eastern redcedar, Manchurian crabapple, ponderosa pine, Russian olive	American sycamore, black locust, golden willow, green ash, honeylocust, red mulberry	Eastern cottonwood
6138:					
Platte, frequently flooded	American plum, redosier dogwood	Common chokecherry	Common hackberry, eastern redcedar	Austrian pine, golden willow, green ash, honeylocust, northern red oak, silver maple	Eastern cottonwood
Barney, frequently flooded, channeled.					
6160:					
Pohocco	American plum, common lilac, forsythia, gray dogwood, Nanking cherry, Peking cotoneaster, redosier dogwood	Amur maple, autumn olive, common chokecherry, Siberian peashrub, silver buffaloberry	Blue spruce, boxelder, bur oak, common hackberry, eastern redcedar	Austrian pine, green ash, pin oak, ponderosa pine, silver maple	Siberian elm
6162:					
Pohocco	American plum, common lilac, forsythia, gray dogwood, Nanking cherry, Peking cotoneaster, redosier dogwood	Amur maple, autumn olive, common chokecherry, Siberian peashrub, silver buffaloberry	Blue spruce, boxelder, bur oak, common hackberry, eastern redcedar	Austrian pine, green ash, pin oak, ponderosa pine, silver maple	Siberian elm
6170:					
Pohocco	American plum, common lilac, forsythia, gray dogwood, Nanking cherry, Peking cotoneaster, redosier dogwood	Amur maple, autumn olive, common chokecherry, Siberian peashrub, silver buffaloberry	Blue spruce, boxelder, bur oak, common hackberry, eastern redcedar	Austrian pine, green ash, pin oak, ponderosa pine, silver maple	Siberian elm
Pahuk	Chokecherry, silver buffaloberry, skunkbush sumac, western sandcherry	Eastern redcedar	Austrian pine, jack pine, ponderosa pine, Scotch pine	---	---

Table 9.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of-- <8	8-15	16-25	26-35	>35
6172:					
Pohocco	American plum, common lilac, forsythia, gray dogwood, Nanking cherry, Peking cotoneaster, redosier dogwood	Amur maple, autumn olive, common chokecherry, Siberian peashrub, silver buffaloberry	Blue spruce, boxelder, bur oak, common hackberry, eastern redcedar	Austrian pine, green ash, pin oak, ponderosa pine, silver maple	Siberian elm
Pahuk	Chokecherry, silver buffaloberry, skunkbush sumac, western sandcherry	Eastern redcedar	Austrian pine, jack pine, ponderosa pine, Scotch pine	---	---
6520:					
Saltillo, occasionally flooded.					
6791:					
Scott.					
7069:					
Steinauer.					
7290:					
Tomek	American plum, common lilac, forsythia, gray dogwood, Nanking cherry, Peking cotoneaster, redosier dogwood	Amur maple, autumn olive, common chokecherry, Siberian peashrub, silver buffaloberry	Blue spruce, boxelder, bur oak, common hackberry, eastern redcedar	Austrian pine, green ash, pin oak, ponderosa pine, silver maple	Siberian elm
7920:					
Wann, occasionally flooded	American plum, blackhaw, fragrant sumac, Siberian peashrub, silver buffaloberry, skunkbush sumac	Common chokecherry, fragrant sumac	Common hackberry, eastern redbud, eastern redcedar, Manchurian crabapple, ponderosa pine, Russian olive	American sycamore, black locust, golden willow, green ash, honeylocust, red mulberry	Eastern cottonwood
8120:					
Yutan	American plum, common lilac, forsythia, gray dogwood, Nanking cherry, Peking cotoneaster, redosier dogwood	Amur maple, autumn olive, common chokecherry, Siberian peashrub, silver buffaloberry	Blue spruce, boxelder, bur oak, common hackberry, eastern redcedar	Austrian pine, green ash, pin oak, ponderosa pine, silver maple	Siberian elm
8124:					
Yutan	American plum, common lilac, forsythia, gray dogwood, Nanking cherry, Peking cotoneaster, redosier dogwood	Amur maple, autumn olive, common chokecherry, Siberian peashrub, silver buffaloberry	Blue spruce, boxelder, bur oak, common hackberry, eastern redcedar	Austrian pine, green ash, pin oak, ponderosa pine, silver maple	Siberian elm

Table 9.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of-- <8	8-15	16-25	26-35	>35
8130:					
Yutan	American plum, common lilac, forsythia, gray dogwood, Nanking cherry, Peking cotoneaster, redosier dogwood	Amur maple, autumn olive, common chokecherry, Siberian peashrub, silver buffaloberry	Blue spruce, boxelder, bur oak, common hackberry, eastern redcedar	Austrian pine, green ash, pin oak, ponderosa pine, silver maple	Siberian elm
Aksarben	American plum, common lilac, forsythia, gray dogwood, Nanking cherry, Peking cotoneaster, redosier dogwood	Amur maple, autumn olive, common chokecherry, Siberian peashrub, silver buffaloberry	Blue spruce, boxelder, bur oak, common hackberry, eastern redcedar	Austrian pine, green ash, pin oak, ponderosa pine, silver maple	Siberian elm
8134:					
Yutan	American plum, common lilac, forsythia, gray dogwood, Nanking cherry, Peking cotoneaster, redosier dogwood	Amur maple, autumn olive, common chokecherry, Siberian peashrub, silver buffaloberry	Blue spruce, boxelder, bur oak, common hackberry, eastern redcedar	Austrian pine, green ash, pin oak, ponderosa pine, silver maple	Siberian elm
Judson	Forsythia, gray dogwood, hazelnut, Peking cotoneaster, redosier dogwood	American plum, amur honeysuckle, autumn olive, fragrant sumac, silver buffaloberry, skunkbush sumac	Black walnut, blue spruce, bur oak, eastern redcedar, green ash, Russian olive	American basswood, Austrian pine, black locust, honeylocust, ponderosa pine, Scotch pine, silver maple	---

Table 10a.--Recreation

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1050:							
Aksarben	98	Somewhat limited		Somewhat limited		Somewhat limited	
		Restricted permeability	0.15	Restricted permeability	0.15	Restricted permeability	0.15
1100:							
Alda, occasionally flooded	85	Very limited		Somewhat limited		Somewhat limited	
		Flooding	1.00	Depth to saturated zone	0.03	Flooding	0.60
		Depth to saturated zone	0.07			Depth to saturated zone	0.07
1347:							
Barney, frequently flooded	87	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Flooding	1.00	Flooding	0.40	Flooding	1.00
1616:							
Boel, occasionally flooded	85	Very limited		Somewhat limited		Somewhat limited	
		Flooding	1.00	Too sandy	0.37	Flooding	0.60
		Too sandy	0.37	Depth to saturated zone	0.03	Too sandy	0.37
		Depth to saturated zone	0.07			Depth to saturated zone	0.07
1873:							
Burchard	50	Somewhat limited		Somewhat limited		Very limited	
		Restricted permeability	0.15	Restricted permeability	0.15	Slope	1.00
		Slope	0.04	Slope	0.04	Restricted permeability	0.15
Steinauer	35	Somewhat limited		Somewhat limited		Very limited	
		Restricted permeability	0.15	Restricted permeability	0.15	Slope	1.00
		Slope	0.04	Slope	0.04	Restricted permeability	0.15
1879:							
Burchard	45	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Restricted permeability	0.15	Restricted permeability	0.15	Restricted permeability	0.15
Steinauer	40	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.96	Slope	0.96	Slope	1.00
		Restricted permeability	0.15	Restricted permeability	0.15	Restricted permeability	0.15
2420:							
Deroin, severely eroded	90	Somewhat limited		Somewhat limited		Very limited	
		Restricted permeability	0.21	Restricted permeability	0.21	Slope	1.00
						Restricted permeability	0.21

Table 10a.--Recreation--Continued

Map symbol and soil name	Pct. of map unit	Camp areas: Rating class and limiting features	Camp areas: Value	Picnic areas: Rating class and limiting features	Picnic areas: Value	Playgrounds: Rating class and limiting features	Playgrounds: Value
2830:							
Filbert-------------	90	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
2844:							
Fillmore------------	90	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Ponding	1.00	Depth to saturated zone	1.00
		Ponding	1.00	Depth to saturated zone	1.00	Ponding	1.00
		Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
2863:							
Fluvaquents---------	95	Not rated		Not rated		Not rated	
3025:							
Gibbon, occasionally flooded------------	95	Very limited		Somewhat limited		Somewhat limited	
		Flooding	1.00	Depth to saturated zone	0.03	Flooding	0.60
		Depth to saturated zone	0.07			Depth to saturated zone	0.07
3038:							
Gibbon, occasionally flooded------------	50	Very limited		Somewhat limited		Somewhat limited	
		Flooding	1.00	Depth to saturated zone	0.03	Flooding	0.60
		Depth to saturated zone	0.07			Depth to saturated zone	0.07
Saltine, occasionally flooded------------	38	Very limited		Very limited		Very limited	
		Flooding	1.00	Sodium content	1.00	Sodium content	1.00
		Sodium content	1.00	Restricted permeability	0.15	Flooding	0.60
		Restricted permeability	0.15	Depth to saturated zone	0.03	Restricted permeability	0.15
		Depth to saturated zone	0.07	Salinity	0.01	Depth to saturated zone	0.07
		Salinity	0.01			Salinity	0.01
3421:							
Hedville------------	80	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Slope	1.00
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
						Content of large stones	0.68
3830:							
Ida-----------------	60	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
Steinauer-----------	30	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Restricted permeability	0.15	Restricted permeability	0.15	Restricted permeability	0.15

Table 10a.--Recreation--Continued

Map symbol and soil name	Pct. of map unit	Camp areas: Rating class and limiting features	Camp areas: Value	Picnic areas: Rating class and limiting features	Picnic areas: Value	Playgrounds: Rating class and limiting features	Playgrounds: Value
3890:							
Inglewood, rarely flooded-----------	85	Very limited		Somewhat limited		Somewhat limited	
		Flooding	1.00	Too sandy	0.37	Too sandy	0.37
		Too sandy	0.37				
4104:							
Judson--------------	85	Not limited		Not limited		Not limited	
4106:							
Judson--------------	90	Not limited		Not limited		Somewhat limited	
						Slope	0.12
4250:							
Kenridge, occasionally flooded-----------	92	Very limited		Somewhat limited		Somewhat limited	
		Flooding	1.00	Restricted permeability	0.15	Flooding	0.60
		Restricted permeability	0.15			Restricted permeability	0.15
4404:							
Lamo, occasionally flooded-----------	96	Very limited		Somewhat limited		Somewhat limited	
		Flooding	1.00	Depth to saturated zone	0.19	Flooding	0.60
		Depth to saturated zone	0.39	Restricted permeability	0.15	Depth to saturated zone	0.39
		Restricted permeability	0.15			Restricted permeability	0.15
4583:							
Lex, occasionally flooded-----------	94	Very limited		Somewhat limited		Somewhat limited	
		Flooding	1.00	Depth to saturated zone	0.19	Flooding	0.60
		Depth to saturated zone	0.39			Depth to saturated zone	0.39
4853:							
Malcolm-------------	85	Not limited		Not limited		Very limited	
						Slope	1.00
4860:							
Malmo, severely eroded------------	85	Very limited		Very limited		Very limited	
		Restricted permeability	1.00	Restricted permeability	1.00	Slope	1.00
		Depth to saturated zone	0.39	Depth to saturated zone	0.19	Restricted permeability	1.00
		Slope	0.04	Slope	0.04	Depth to saturated zone	0.39
5388:							
Morrill-------------	89	Somewhat limited		Somewhat limited		Very limited	
		Restricted permeability	0.26	Restricted permeability	0.26	Slope	1.00
		Slope	0.04	Slope	0.04	Restricted permeability	0.26
						Gravel content	0.06

Table 10a.--Recreation--Continued

Map symbol and soil name	Pct. of map unit	Camp areas: Rating class and limiting features	Value	Picnic areas: Rating class and limiting features	Value	Playgrounds: Rating class and limiting features	Value
5480:							
Muscotah, occasionally flooded-----------	90	Very limited		Somewhat limited		Somewhat limited	
		Flooding	1.00	Restricted permeability	0.94	Restricted permeability	0.94
		Restricted permeability	0.94	Depth to saturated zone	0.03	Flooding	0.60
		Depth to saturated zone	0.07			Depth to saturated zone	0.07
5540:							
Nodaway, occasionally flooded-----------	90	Very limited		Not limited		Somewhat limited	
		Flooding	1.00			Flooding	0.60
5541:							
Nodaway, channeled--	85	Very limited		Somewhat limited		Very limited	
		Flooding	1.00	Flooding	0.40	Flooding	1.00
5736:							
Obert, frequently flooded-----------	80	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Ponding	1.00	Depth to saturated zone	1.00
		Flooding	1.00	Depth to saturated zone	1.00	Flooding	1.00
		Ponding	1.00	Flooding	0.40	Ponding	1.00
		Restricted permeability	0.15	Restricted permeability	0.15	Restricted permeability	0.15
5742:							
Obert, occasionally flooded-----------	86	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Flooding	1.00	Restricted permeability	0.15	Flooding	0.60
		Restricted permeability	0.15			Restricted permeability	0.15
5780:							
Olmitz-------------	85	Not limited		Not limited		Somewhat limited	
						Slope	0.12
6046:							
Pawnee-------------	80	Very limited		Very limited		Very limited	
		Restricted permeability	1.00	Restricted permeability	1.00	Slope	1.00
		Depth to saturated zone	0.39	Depth to saturated zone	0.19	Restricted permeability	1.00
		Slope	0.04	Slope	0.04	Depth to saturated zone	0.39
6130:							
Platte, occasionally flooded-----------	80	Very limited		Somewhat limited		Somewhat limited	
		Flooding	1.00	Depth to saturated zone	0.19	Flooding	0.60
		Depth to saturated zone	0.39			Depth to saturated zone	0.39

Table 10a.--Recreation--Continued

Map symbol and soil name	Pct. of map unit	Camp areas: Rating class and limiting features	Camp areas: Value	Picnic areas: Rating class and limiting features	Picnic areas: Value	Playgrounds: Rating class and limiting features	Playgrounds: Value
6138:							
Platte, frequently flooded	50	Very limited		Somewhat limited		Very limited	
		Flooding	1.00	Flooding	0.40	Flooding	1.00
		Depth to saturated zone	0.39	Depth to saturated zone	0.19	Depth to saturated zone	0.39
Barney, frequently flooded, channeled	46	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Flooding	1.00	Flooding	0.40	Flooding	1.00
6160:							
Pohocco	80	Not limited		Not limited		Very limited	
						Slope	1.00
6162:							
Pohocco	80	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.96	Slope	0.96	Slope	1.00
6170:							
Pohocco	52	Not limited		Not limited		Very limited	
						Slope	1.00
Pahuk	45	Somewhat limited		Somewhat limited		Very limited	
		Too sandy	0.96	Too sandy	0.96	Slope	1.00
						Too sandy	0.96
6172:							
Pohocco	59	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.96	Slope	0.96	Slope	1.00
Pahuk	35	Somewhat limited		Somewhat limited		Very limited	
		Too sandy	0.96	Too sandy	0.96	Slope	1.00
		Slope	0.96	Slope	0.96	Too sandy	0.96
6520:							
Saltillo, occasionally flooded	85	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Sodium content	1.00	Sodium content	1.00	Sodium content	1.00
		Flooding	1.00	Salinity	1.00	Salinity	1.00
		Salinity	1.00			Flooding	0.60
6791:							
Scott	100	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Ponding	1.00	Depth to saturated zone	1.00
		Ponding	1.00	Depth to saturated zone	1.00	Ponding	1.00
		Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
7069:							
Steinauer	85	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Restricted permeability	0.15	Restricted permeability	0.15	Restricted permeability	0.15

Table 10a.--Recreation--Continued

Map symbol and soil name	Pct. of map unit	Camp areas: Rating class and limiting features	Value	Picnic areas: Rating class and limiting features	Value	Playgrounds: Rating class and limiting features	Value
7290:							
Tomek	86	Somewhat limited		Somewhat limited		Somewhat limited	
		Restricted permeability	0.21	Restricted permeability	0.21	Restricted permeability	0.21
7920:							
Wann, occasionally flooded	92	Very limited		Not limited		Somewhat limited	
		Flooding	1.00			Flooding	0.60
8120:							
Yutan	88	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.96	Slope	0.96	Slope	1.00
		Restricted permeability	0.15	Restricted permeability	0.15	Restricted permeability	0.15
8124:							
Yutan	92	Somewhat limited		Somewhat limited		Somewhat limited	
		Restricted permeability	0.15	Restricted permeability	0.15	Slope	0.50
						Restricted permeability	0.15
8130:							
Yutan	65	Somewhat limited		Somewhat limited		Somewhat limited	
		Restricted permeability	0.15	Restricted permeability	0.15	Slope	0.50
						Restricted permeability	0.15
Aksarben	33	Somewhat limited		Somewhat limited		Somewhat limited	
		Restricted permeability	0.15	Restricted permeability	0.15	Slope	0.50
						Restricted permeability	0.15
8134:							
Yutan	64	Somewhat limited		Somewhat limited		Very limited	
		Restricted permeability	0.15	Restricted permeability	0.15	Slope	1.00
						Restricted permeability	0.15
Judson	25	Not limited		Not limited		Very limited	
						Slope	1.00
9900:							
Arents, earthen dam	100	Not rated		Not rated		Not rated	
9985:							
Gravel pits	100	Not rated		Not rated		Not rated	
9998:							
Water	100	Not rated		Not rated		Not rated	

Table 10b.--Recreation

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Paths and trails		Off-road motorcycle trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1050:							
Aksarben------------	98	Not limited		Not limited		Not limited	
1100:							
Alda, occasionally flooded------------	85	Not limited		Not limited		Somewhat limited	
						Flooding	0.60
						Depth to saturated zone	0.03
1347:							
Barney, frequently flooded------------	87	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Flooding	1.00
		Flooding	0.40	Flooding	0.40	Depth to saturated zone	1.00
						Droughty	0.42
1616:							
Boel, occasionally flooded------------	85	Somewhat limited		Somewhat limited		Somewhat limited	
		Too sandy	0.37	Too sandy	0.37	Flooding	0.60
						Droughty	0.12
						Depth to saturated zone	0.03
1873:							
Burchard------------	50	Not limited		Not limited		Somewhat limited	
						Slope	0.04
Steinauer-----------	35	Not limited		Not limited		Somewhat limited	
						Slope	0.04
1879:							
Burchard------------	45	Not limited		Not limited		Very limited	
						Slope	1.00
Steinauer-----------	40	Not limited		Not limited		Somewhat limited	
						Slope	0.96
2420:							
Deroin, severely eroded------------	90	Not limited		Not limited		Not limited	
2830:							
Filbert------------	90	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
2844:							
Fillmore------------	90	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Ponding	1.00
		Ponding	1.00	Ponding	1.00	Depth to saturated zone	1.00

Table 10b.--Recreation--Continued

Map symbol and soil name	Pct. of map unit	Paths and trails: Rating class and limiting features	Value	Off-road motorcycle trails: Rating class and limiting features	Value	Golf fairways: Rating class and limiting features	Value
2863:							
Fluvaquents	95	Not rated		Not rated		Very limited	
						Ponding	1.00
						Flooding	1.00
						Depth to saturated zone	1.00
						Too clayey	1.00
3025:							
Gibbon, occasionally flooded	95	Not limited		Not limited		Somewhat limited	
						Flooding	0.60
						Depth to saturated zone	0.03
3038:							
Gibbon, occasionally flooded	50	Not limited		Not limited		Somewhat limited	
						Flooding	0.60
						Depth to saturated zone	0.03
Saltine, occasionally flooded	38	Not limited		Not limited		Very limited	
						Sodium content	1.00
						Flooding	0.60
						Depth to saturated zone	0.03
						Salinity	0.01
3421:							
Hedville	80	Somewhat limited		Not limited		Very limited	
		Slope	0.18			Depth to bedrock	1.00
						Droughty	1.00
						Slope	1.00
						Content of large stones	0.68
3830:							
Ida	60	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	0.99	Slope	1.00
Steinauer	30	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	0.99	Slope	1.00
3890:							
Inglewood, rarely flooded	85	Somewhat limited		Somewhat limited		Not limited	
		Too sandy	0.37	Too sandy	0.37		
4104:							
Judson	85	Not limited		Not limited		Not limited	
4106:							
Judson	90	Not limited		Not limited		Not limited	
4250:							
Kenridge, occasionally flooded	92	Not limited		Not limited		Somewhat limited	
						Flooding	0.60

Table 10b.--Recreation--Continued

Map symbol and soil name	Pct. of map unit	Paths and trails: Rating class and limiting features	Value	Off-road motorcycle trails: Rating class and limiting features	Value	Golf fairways: Rating class and limiting features	Value
4404:							
Lamo, occasionally flooded	96	Not limited		Not limited		Somewhat limited	
						Flooding	0.60
						Depth to saturated zone	0.19
4583:							
Lex, occasionally flooded	94	Not limited		Not limited		Somewhat limited	
						Flooding	0.60
						Depth to saturated zone	0.19
4853:							
Malcolm	85	Not limited		Not limited		Not limited	
4860:							
Malmo, severely eroded	85	Very limited		Very limited		Somewhat limited	
		Water erosion	1.00	Water erosion	1.00	Depth to saturated zone	0.19
						Slope	0.04
5388:							
Morrill	89	Not limited		Not limited		Somewhat limited	
						Slope	0.04
5480:							
Muscotah, occasionally flooded	90	Not limited		Not limited		Somewhat limited	
						Flooding	0.60
						Depth to saturated zone	0.03
5540:							
Nodaway, occasionally flooded	90	Not limited		Not limited		Somewhat limited	
						Flooding	0.60
5541:							
Nodaway, channeled	85	Somewhat limited		Somewhat limited		Very limited	
		Flooding	0.40	Flooding	0.40	Flooding	1.00
5736:							
Obert, frequently flooded	80	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Ponding	1.00
		Ponding	1.00	Ponding	1.00	Flooding	1.00
		Flooding	0.40	Flooding	0.40	Depth to saturated zone	1.00
5742:							
Obert, occasionally flooded	86	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
						Flooding	0.60

Table 10b.--Recreation--Continued

Map symbol and soil name	Pct. of map unit	Paths and trails: Rating class and limiting features	Value	Off-road motorcycle trails: Rating class and limiting features	Value	Golf fairways: Rating class and limiting features	Value
5780:							
Olmitz	85	Not limited		Not limited		Not limited	
6046:							
Pawnee	80	Very limited		Very limited		Somewhat limited	
		Water erosion	1.00	Water erosion	1.00	Depth to saturated zone	0.19
						Slope	0.04
6130:							
Platte, occasionally flooded	80	Not limited		Not limited		Somewhat limited	
						Flooding	0.60
						Depth to saturated zone	0.19
						Droughty	0.17
6138:							
Platte, frequently flooded	50	Somewhat limited		Somewhat limited		Very limited	
		Flooding	0.40	Flooding	0.40	Flooding	1.00
						Depth to saturated zone	0.19
						Droughty	0.17
Barney, frequently flooded, channeled	46	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Flooding	1.00
		Flooding	0.40	Flooding	0.40	Depth to saturated zone	1.00
						Droughty	0.42
6160:							
Pohocco	80	Not limited		Not limited		Not limited	
6162:							
Pohocco	80	Very limited		Very limited		Somewhat limited	
		Water erosion	1.00	Water erosion	1.00	Slope	0.96
6170:							
Pohocco	52	Not limited		Not limited		Not limited	
Pahuk	45	Somewhat limited		Somewhat limited		Somewhat limited	
		Too sandy	0.96	Too sandy	0.96	Droughty	0.64
6172:							
Pohocco	59	Very limited		Very limited		Somewhat limited	
		Water erosion	1.00	Water erosion	1.00	Slope	0.96
Pahuk	35	Somewhat limited		Somewhat limited		Somewhat limited	
		Too sandy	0.96	Too sandy	0.96	Slope	0.96
						Droughty	0.64
6520:							
Saltillo, occasionally flooded	85	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Sodium content	1.00
						Depth to saturated zone	1.00
						Salinity	1.00
						Flooding	0.60

Table 10b.--Recreation--Continued

Map symbol and soil name	Pct. of map unit	Paths and trails: Rating class and limiting features	Value	Off-road motorcycle trails: Rating class and limiting features	Value	Golf fairways: Rating class and limiting features	Value
6791:							
Scott	100	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Ponding	1.00
		Ponding	1.00	Ponding	1.00	Depth to saturated zone	1.00
7069:							
Steinauer	85	Somewhat limited		Not limited		Very limited	
		Slope	0.50			Slope	1.00
7290:							
Tomek	86	Not limited		Not limited		Not limited	
7920:							
Wann, occasionally flooded	92	Not limited		Not limited		Somewhat limited	
						Flooding	0.60
8120:							
Yutan	88	Very limited		Very limited		Somewhat limited	
		Water erosion	1.00	Water erosion	1.00	Slope	0.96
8124:							
Yutan	92	Not limited		Not limited		Not limited	
8130:							
Yutan	65	Not limited		Not limited		Not limited	
Aksarben	33	Not limited		Not limited		Not limited	
8134:							
Yutan	64	Not limited		Not limited		Not limited	
Judson	25	Not limited		Not limited		Not limited	
9900:							
Arents, earthen dam	100	Not rated		Not rated		Not rated	
9985:							
Gravel pits	100	Not rated		Not rated		Not rated	
9998:							
Water	100	Not rated		Not rated		Not rated	

Table 11.--Wildlife Habitat

(See text for definitions of terms used in this table. Absence of an entry indicates that no rating is applicable.)

Map symbol and soil name	Potential for habitat elements: Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Shrubs	Wetland plants	Shallow water areas	Potential as habitat for--: Openland wildlife	Woodland wildlife	Wetland wildlife	Rangeland wildlife
1050:												
Aksarben----------------	Good	Good	Good	Good	Good	---	Poor	Poor	Good	Good	Poor	---
1100:												
Alda, occasionally flooded----------------	Fair	Fair	Fair	Good	Good	Good	Fair	Fair	Fair	Good	Fair	Good
1347:												
Barney, frequently flooded----------------	Very poor	Poor	Fair	Poor	Poor	Fair	Good	Good	Poor	Poor	Good	Fair
1616:												
Boel, occasionally flooded----------------	Fair	Fair	Good	Good	Good	Good	Fair	Fair	Fair	Good	Poor	Fair
1873:												
Burchard----------------	Fair	Good	Good	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor	Good
Steinauer----------------	Poor	Fair	Good	Good	Good	Good	Very poor	Very poor	Fair	Good	Very poor	Good
1879:												
Burchard----------------	Fair	Good	Good	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor	Good
Steinauer----------------	Poor	Fair	Good	Good	Good	Good	Very poor	Very poor	Fair	Good	Very poor	Good
2420:												
Deroin, severely eroded-	Fair	Good	Good	Good	Good	---	Poor	Poor	Good	Good	Poor	---
2830:												
Filbert--- ---------	Good	Good	Good	---	Good	Good	Fair	Fair	Good	---	Fair	Good
2844:												
Fillmore----------------	Fair	Good	Fair	Fair	Fair	Fair	Good	Fair	Fair	Fair	Good	Fair
2863:												
Fluvaquents-------------	Very poor	Very poor	Poor	Very poor	Very poor	Very poor	Good	Good	Very poor	Very poor	Good	Very poor
3025:												
Gibbon, occasionally flooded----------------	Good	Good	Good	Good	Fair	Good	Fair	Good	Good	Good	Fair	Good
3038:												
Gibbon, occasionally flooded----------------	Good	Good	Good	Good	Fair	Good	Fair	Good	Good	Good	Fair	Good
Saltine, occasionally flooded----------------	Poor	Poor	Good	Poor	Poor	Poor	Good	Good	Poor	Poor	Good	Poor
3421:												
Hedville----------------	Very poor	Poor	Poor	---	---	Poor	Very poor	Very poor	Poor	---	Very poor	Poor

Table 11.--Wildlife Habitat--Continued

Map symbol and soil name	Potential for habitat elements: Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Shrubs	Wetland plants	Shallow water areas	Potential as habitat for--: Openland wildlife	Woodland wildlife	Wetland wildlife	Rangeland wildlife
3830:												
Ida----------------------	Very poor	Very poor	Good	Poor	Poor	---	Very poor	Very poor	Poor	Poor	Very poor	---
Steinauer----------------	Poor	Fair	Good	Good	Good	Good	Very poor	Very poor	Fair	Good	Very poor	Good
3890:												
Inglewood, rarely flooded----------------	Poor	Fair	Good	Fair	Fair	Good	Poor	Very poor	Fair	Poor	Very poor	Good
4104:												
Judson-------------------	Good	Good	Good	Good	Good	---	Poor	Poor	Good	Good	Poor	---
4106:												
Judson-------------------	Good	Good	Good	Good	Good	---	Poor	Poor	Good	Good	Poor	---
4250:												
Kenridge, occasionally flooded----------------	Good	Good	Good	Good	Good	Fair	Poor	Poor	Good	Good	Poor	Fair
4404:												
Lamo, occasionally flooded----------------	Good	Good	Good	Good	Good	Good	Fair	Fair	Good	Fair	Fair	Good
4583:												
Lex, occasionally flooded----------------	Fair	Fair	Good	Fair	Good	Good	Fair	Fair	Fair	Fair	Fair	Good
4853:												
Malcolm------------------	Fair	Good	Good	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor	Good
4860:												
Malmo, severely eroded--	Fair	Good	Good	Good	Good	Fair	Very poor	Very poor	Good	Good	Very poor	Fair
5388:												
Morrill------------------	Fair	Good	Good	Fair	Fair	Good	Very poor	Very poor	Good	Fair	Very poor	Good
5480:												
Muscotah, occasionally flooded----------------	Fair	Good	Good	Poor	Good	Good	Fair	Fair	Good	Good	Fair	---
5540:												
Nodaway, occasionally flooded----------------	Good	Good	Good	Good	Fair	---	Fair	Poor	Fair	Good	Fair	---
5541:												
Nodaway, channeled------	Poor	Fair	Fair	Fair	Poor	---	Fair	Fair	Fair	Fair	Poor	---
5736:												
Obert, frequently flooded----------------	Very poor	Poor	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good	Poor
5742:												
Obert, occasionally flooded----------------	Very poor	Poor	Fair	Fair	Fair	Fair	Good	Good	Poor	Fair	Good	Fair

Table 11.--Wildlife Habitat--Continued

Map symbol and soil name	Potential for habitat elements								Potential as habitat for--			
	Grain and seed crops	Grasses and legumes	Wild herba- ceous plants	Hard- wood trees	Conif- erous plants	Shrubs	Wetland plants	Shallow water areas	Open- land wild- life	Wood- land wild- life	Wetland wild- life	Range- land wild- life
5780:												
Olmitz	Good	Good	Fair	Good	Good	---	Poor	Poor	Good	Good	Poor	---
6046:												
Pawnee	Fair	Good	Good	---	Fair	Fair	Very poor	Very poor	Good	Good	Very poor	Fair
6130:												
Platte, occasionally flooded	Fair	Good	Fair	Poor	Fair	Good	Fair	Good	Fair	Poor	Good	Fair
6138:												
Platte, frequently flooded	Fair	Good	Fair	Poor	Fair	Good	Fair	Good	Fair	Poor	Good	Fair
Barney, frequently flooded, channeled	Very poor	Poor	Fair	Poor	Poor	Fair	Good	Good	Poor	Poor	Good	Fair
6160:												
Pohocco	Fair	Good	Good	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor	Good
6162:												
Pohocco	Fair	Good	Good	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor	Good
6170:												
Pohocco	Fair	Good	Good	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor	Good
Pahuk	Poor	Poor	Fair	Poor	Poor	Good	Very poor	Very poor	Poor	Very poor	Very poor	Fair
6172:												
Pohocco	Fair	Good	Good	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor	Good
Pahuk	Poor	Poor	Fair	Poor	Poor	Good	Very poor	Very poor	Poor	Very poor	Very poor	Fair
6520:												
Saltillo, occasionally flooded	Poor	Poor	Good	Poor	Poor	Poor	Good	Good	Poor	Poor	Good	Poor
6791:												
Scott	Very poor	Poor	Poor	Poor	Very poor	Poor	Good	Good	Poor	Poor	Good	Poor
7069:												
Steinauer	Poor	Fair	Good	Good	Good	Good	Very poor	Very poor	Fair	Good	Very poor	Good
7290:												
Tomek	Good	Good	Good	Good	Good	---	Poor	Poor	Good	Good	Poor	---
7920:												
Wann, occasionally flooded	Good	Good	Good	Good	Fair	Good	Poor	Fair	Good	Good	Fair	Good
8120:												
Yutan	Fair	Good	Good	Good	Good	---	Poor	Poor	Good	Good	Poor	---

Table 11.--Wildlife Habitat--Continued

Map symbol and soil name	Potential for habitat elements: Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Shrubs	Wetland plants	Shallow water areas	Potential as habitat for--: Openland wildlife	Woodland wildlife	Wetland wildlife	Rangeland wildlife
8124:												
Yutan	Fair	Good	Good	Good	Good	---	Poor	Poor	Good	Good	Poor	---
8130:												
Yutan	Fair	Good	Good	Good	Good	---	Poor	Poor	Good	Good	Poor	---
Aksarben	Good	Good	Good	Good	Good	---	Poor	Poor	Good	Good	Poor	---
8134:												
Yutan	Fair	Good	Good	Good	Good	---	Poor	Poor	Good	Good	Poor	---
Judson	Good	Good	Good	Good	Good	---	Poor	Poor	Good	Good	Poor	---
9985:												
Gravel pits	Very poor	Very poor	Poor	Poor	Poor	Poor	Very poor	Fair	Very poor	Very poor	Poor	Poor

Table 12a.--Building Site Development

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1050:							
Aksarben------------	98	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
1100:							
Alda, occasionally							
flooded------------	85	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Depth to saturated zone	0.07	Depth to saturated zone	1.00	Depth to saturated zone	0.07
1347:							
Barney, frequently							
flooded------------	87	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
1616:							
Boel, occasionally							
flooded------------	85	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Depth to saturated zone	0.07	Depth to saturated zone	1.00	Depth to saturated zone	0.07
1873:							
Burchard------------	50	Somewhat limited		Somewhat limited		Very limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Slope	1.00
		Slope	0.04	Slope	0.04	Shrink-swell	0.50
Steinauer-----------	35	Somewhat limited		Somewhat limited		Very limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Slope	1.00
		Slope	0.04	Slope	0.04	Shrink-swell	0.50
1879:							
Burchard------------	45	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
Steinauer-----------	40	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.96	Slope	0.96	Slope	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
2420:							
Deroin, severely							
eroded-------------	90	Somewhat limited		Somewhat limited		Very limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Slope	1.00
						Shrink-swell	0.50
2830:							
Filbert-------------	90	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00

Table 12a.--Building Site Development--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements: Rating class and limiting features	Value	Dwellings with basements: Rating class and limiting features	Value	Small commercial buildings: Rating class and limiting features	Value
2844:							
Fillmore	90	Very limited		Very limited		Very limited	
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
2863:							
Fluvaquents	95	Very limited		Very limited		Very limited	
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
3025:							
Gibbon, occasionally flooded	95	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Depth to saturated zone	0.07	Depth to saturated zone	1.00	Depth to saturated zone	0.07
3038:							
Gibbon, occasionally flooded	50	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Depth to saturated zone	0.07	Depth to saturated zone	1.00	Depth to saturated zone	0.07
Saltine, occasionally flooded	38	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Shrink-swell	0.50	Depth to saturated zone	1.00	Shrink-swell	0.50
		Depth to saturated zone	0.07	Shrink-swell	1.00	Depth to saturated zone	0.07
3421:							
Hedville	80	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Slope	1.00	Slope	1.00
3830:							
Ida	60	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
Steinauer	30	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
3890:							
Inglewood, rarely flooded	85	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
				Depth to saturated zone	0.35		
4104:							
Judson	85	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50

Table 12a.--Building Site Development--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements: Rating class and limiting features	Value	Dwellings with basements: Rating class and limiting features	Value	Small commercial buildings: Rating class and limiting features	Value
4106:							
Judson	90	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
4250:							
Kenridge, occasionally flooded	92	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
				Depth to saturated zone	0.35		
4404:							
Lamo, occasionally flooded	96	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Shrink-swell	0.50	Depth to saturated zone	1.00	Shrink-swell	0.50
		Depth to saturated zone	0.39	Shrink-swell	0.50	Depth to saturated zone	0.39
4583:							
Lex, occasionally flooded	94	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Depth to saturated zone	0.39	Depth to saturated zone	1.00	Depth to saturated zone	0.39
4853:							
Malcolm	85	Not limited		Not limited		Very limited	
						Slope	1.00
4860:							
Malmo, severely eroded	85	Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Depth to saturated zone	1.00	Shrink-swell	1.00
		Depth to saturated zone	0.39	Shrink-swell	0.50	Slope	1.00
		Slope	0.04	Slope	0.04	Depth to saturated zone	0.39
5388:							
Morrill	89	Somewhat limited		Somewhat limited		Very limited	
		Shrink-swell	0.50	Slope	0.04	Slope	1.00
		Slope	0.04			Shrink-swell	0.50
5480:							
Muscotah, occasionally flooded	90	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Shrink-swell	1.00	Depth to saturated zone	1.00	Shrink-swell	1.00
		Depth to saturated zone	0.07	Shrink-swell	1.00	Depth to saturated zone	0.07

Table 12a.--Building Site Development--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements: Rating class and limiting features	Value	Dwellings with basements: Rating class and limiting features	Value	Small commercial buildings: Rating class and limiting features	Value
5540:							
Nodaway, occasionally flooded-----------	90	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Shrink-swell	0.50	Depth to saturated zone	0.61	Shrink-swell	0.50
				Shrink-swell	0.50		
5541:							
Nodaway, channeled--	85	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Shrink-swell	0.50	Depth to saturated zone	0.61	Shrink-swell	0.50
				Shrink-swell	0.50		
5736:							
Obert, frequently flooded-----------	80	Very limited		Very limited		Very limited	
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
5742:							
Obert, occasionally flooded-----------	86	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
5780:							
Olmitz--------------	85	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
6046:							
Pawnee--------------	80	Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Depth to saturated zone	1.00	Shrink-swell	1.00
		Depth to saturated zone	0.39	Shrink-swell	1.00	Slope	1.00
		Slope	0.04	Slope	0.04	Depth to saturated zone	0.39
6130:							
Platte, occasionally flooded-----------	80	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Depth to saturated zone	0.39	Depth to saturated zone	1.00	Depth to saturated zone	0.39
6138:							
Platte, frequently flooded-----------	50	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Depth to saturated zone	0.39	Depth to saturated zone	1.00	Depth to saturated zone	0.39

Table 12a.--Building Site Development--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements. Rating class and limiting features	Value	Dwellings with basements Rating class and limiting features	Value	Small commercial buildings Rating class and limiting features	Value
6138:							
Barney, frequently flooded, channeled	46	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
6160:							
Pohocco	80	Somewhat limited		Somewhat limited		Very limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Slope	1.00
						Shrink-swell	0.50
6162:							
Pohocco	80	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.96	Slope	0.96	Slope	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
6170:							
Pohocco	52	Somewhat limited		Somewhat limited		Very limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Slope	1.00
						Shrink-swell	0.50
Pahuk	45	Not limited		Not limited		Very limited	
						Slope	1.00
6172:							
Pohocco	59	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.96	Slope	0.96	Slope	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
Pahuk	35	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.96	Slope	0.96	Slope	1.00
6520:							
Saltillo, occasionally flooded	85	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
6791:							
Scott	100	Very limited		Very limited		Very limited	
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
7069:							
Steinauer	85	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
7290:							
Tomek	86	Very limited		Very limited		Very limited	
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00

Table 12a.--Building Site Development--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements: Rating class and limiting features	Value	Dwellings with basements: Rating class and limiting features	Value	Small commercial buildings: Rating class and limiting features	Value
7920:							
Wann, occasionally flooded	92	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
				Depth to saturated zone	1.00		
8120:							
Yutan	88	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.96	Slope	0.96	Slope	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
8124:							
Yutan	92	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
8130:							
Yutan	65	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
Aksarben	33	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
8134:							
Yutan	64	Somewhat limited		Somewhat limited		Very limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Slope	1.00
						Shrink-swell	0.50
Judson	25	Somewhat limited		Somewhat limited		Very limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Slope	1.00
						Shrink-swell	0.50
9900:							
Arents, earthen dam	100	Not rated		Not rated		Not rated	
9985:							
Gravel pits	100	Not rated		Not rated		Not rated	
9998:							
Water	100	Not rated		Not rated		Not rated	

Table 12b.--Building Site Development

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Local roads and streets: Rating class and limiting features	Value	Shallow excavations: Rating class and limiting features	Value	Lawns and landscaping: Rating class and limiting features	Value
1050:							
Aksarben------------	98	Very limited		Somewhat limited		Not limited	
		Frost action	1.00	Cutbanks cave	0.10		
		Shrink-swell	0.50				
1100:							
Alda, occasionally flooded-----------	85	Very limited		Very limited		Somewhat limited	
		Frost action	1.00	Depth to saturated zone	1.00	Flooding	0.60
		Flooding	1.00	Cutbanks cave	1.00	Depth to saturated zone	0.03
		Depth to saturated zone	0.03	Flooding	0.60		
1347:							
Barney, frequently flooded-----------	87	Very limited		Very limited		Very limited	
		Flooding	1.00	Depth to saturated zone	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Cutbanks cave	1.00	Depth to saturated zone	1.00
		Frost action	0.50	Flooding	0.80	Droughty	0.42
				Depth to dense layer	0.50		
1616:							
Boel, occasionally flooded-----------	85	Very limited		Very limited		Somewhat limited	
		Flooding	1.00	Depth to saturated zone	1.00	Flooding	0.60
		Frost action	0.50	Cutbanks cave	1.00	Droughty	0.12
		Depth to saturated zone	0.03	Flooding	0.60	Depth to saturated zone	0.03
1873:							
Burchard------------	50	Very limited		Somewhat limited		Somewhat limited	
		Low strength	1.00	Cutbanks cave	0.10	Slope	0.04
		Shrink-swell	0.50	Slope	0.04		
		Frost action	0.50				
		Slope	0.04				
Steinauer-----------	35	Very limited		Somewhat limited		Somewhat limited	
		Low strength	1.00	Cutbanks cave	0.10	Slope	0.04
		Shrink-swell	0.50	Slope	0.04		
		Frost action	0.50				
		Slope	0.04				
1879:							
Burchard------------	45	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Low strength	1.00	Cutbanks cave	0.10		
		Shrink-swell	0.50				
		Frost action	0.50				
Steinauer-----------	40	Very limited		Somewhat limited		Somewhat limited	
		Low strength	1.00	Slope	0.96	Slope	0.96
		Slope	0.96	Cutbanks cave	0.10		
		Shrink-swell	0.50				
		Frost action	0.50				

Table 12b.--Building Site Development--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
2420:							
Deroin, severely eroded------------	90	Very limited		Somewhat limited		Not limited	
		Frost action	1.00	Cutbanks cave	0.10		
		Low strength	1.00				
		Shrink-swell	0.50				
2830:							
Filbert-------------	90	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Frost action	1.00	Too clayey	0.50		
		Shrink-swell	1.00	Cutbanks cave	0.10		
2844:							
Fillmore------------	90	Very limited		Very limited		Very limited	
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Frost action	1.00	Too clayey	0.50		
		Low strength	1.00	Cutbanks cave	0.10		
		Shrink-swell	1.00				
2863:							
Fluvaquents---------	95	Very limited		Very limited		Very limited	
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Flooding	1.00
		Flooding	1.00	Flooding	0.80	Depth to saturated zone	1.00
		Frost action	0.50	Cutbanks cave	0.10	Too clayey	1.00
				Too clayey	0.02		
3025:							
Gibbon, occasionally flooded-----------	95	Very limited		Very limited		Somewhat limited	
		Frost action	1.00	Depth to saturated zone	1.00	Flooding	0.60
		Flooding	1.00	Flooding	0.60	Depth to saturated zone	0.03
		Low strength	0.22	Cutbanks cave	0.10		
		Depth to saturated zone	0.03				
3038:							
Gibbon, occasionally flooded-----------	50	Very limited		Very limited		Somewhat limited	
		Frost action	1.00	Depth to saturated zone	1.00	Flooding	0.60
		Flooding	1.00	Flooding	0.60	Depth to saturated zone	0.03
		Depth to saturated zone	0.03	Cutbanks cave	0.10		
Saltine, occasionally flooded-----------	38	Very limited		Very limited		Very limited	
		Frost action	1.00	Depth to saturated zone	1.00	Sodium content	1.00
		Flooding	1.00	Flooding	0.60	Flooding	0.60
		Low strength	1.00	Cutbanks cave	0.10	Depth to saturated zone	0.03
		Shrink-swell	0.50			Salinity	0.01
		Depth to saturated zone	0.03				

Table 12b.--Building Site Development--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets: Rating class and limiting features	Value	Shallow excavations: Rating class and limiting features	Value	Lawns and landscaping: Rating class and limiting features	Value
3421:							
Hedville------------	80	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to bedrock	1.00
						Droughty	1.00
		Slope	1.00	Slope	1.00	Slope	1.00
		Frost action	0.50	Cutbanks cave	0.10	Content of large stones	0.60
3830:							
Ida-----------------	60	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Frost action	1.00	Cutbanks cave	0.10		
		Low strength	1.00				
Steinauer-----------	30	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Low strength	1.00	Cutbanks cave	0.10		
		Shrink-swell	0.50				
		Frost action	0.50				
3890:							
Inglewood, rarely flooded-----------	85	Somewhat limited		Very limited		Not limited	
		Frost action	0.50	Cutbanks cave	1.00		
		Flooding	0.40	Depth to saturated zone	0.35		
4104:							
Judson--------------	85	Very limited		Somewhat limited		Not limited	
		Frost action	1.00	Cutbanks cave	0.10		
		Low strength	1.00				
		Shrink-swell	0.50				
4106:							
Judson--------------	90	Very limited		Somewhat limited		Not limited	
		Frost action	1.00	Cutbanks cave	0.10		
		Low strength	1.00				
		Shrink-swell	0.50				
4250:							
Kenridge, occasionally flooded-----------	92	Very limited		Somewhat limited		Somewhat limited	
		Frost action	1.00	Flooding	0.60	Flooding	0.60
		Flooding	1.00	Depth to saturated zone	0.35		
		Low strength	1.00				
		Shrink-swell	0.50	Cutbanks cave	0.10		
4404:							
Lamo, occasionally flooded-----------	96	Very limited		Very limited		Somewhat limited	
		Frost action	1.00	Depth to saturated zone	1.00	Flooding	0.60
		Flooding	1.00			Depth to saturated zone	0.19
		Low strength	1.00	Flooding	0.60		
		Shrink-swell	0.50	Cutbanks cave	0.10		
		Depth to saturated zone	0.19				

Table 12b.--Building Site Development--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets: Rating class and limiting features	Value	Shallow excavations: Rating class and limiting features	Value	Lawns and landscaping: Rating class and limiting features	Value
4583:							
Lex, occasionally flooded-----------	94	Very limited		Very limited		Somewhat limited	
		Frost action	1.00	Depth to saturated zone	1.00	Flooding	0.60
		Flooding	1.00	Cutbanks cave	1.00	Depth to saturated zone	0.19
		Depth to saturated zone	0.19	Flooding	0.60		
4853:							
Malcolm-------------	85	Very limited		Somewhat limited		Not limited	
		Frost action	1.00	Cutbanks cave	0.10		
		Low strength	0.22				
4860:							
Malmo, severely eroded-------------	85	Very limited		Very limited		Somewhat limited	
		Frost action	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.19
		Low strength	1.00	Cutbanks cave	1.00	Slope	0.04
		Shrink-swell	1.00	Too clayey	0.18		
		Depth to saturated zone	0.19	Slope	0.04		
		Slope	0.04				
5388:							
Morrill-------------	89	Somewhat limited		Very limited		Somewhat limited	
		Shrink-swell	0.50	Cutbanks cave	1.00	Slope	0.04
		Frost action	0.50	Slope	0.04		
		Slope	0.04				
5480:							
Muscotah, occasionally flooded------------	90	Very limited		Very limited		Somewhat limited	
		Flooding	1.00	Depth to saturated zone	1.00	Flooding	0.60
		Low strength	1.00	Flooding	0.60	Depth to saturated zone	0.03
		Shrink-swell	1.00	Cutbanks cave	0.10		
		Frost action	0.50	Too clayey	0.02		
		Depth to saturated zone	0.03				
5540:							
Nodaway, occasionally flooded------------	90	Very limited		Somewhat limited		Somewhat limited	
		Frost action	1.00	Depth to saturated zone	0.61	Flooding	0.60
		Flooding	1.00	Flooding	0.60		
		Low strength	1.00	Cutbanks cave	0.10		
		Shrink-swell	0.50				
5541:							
Nodaway, channeled--	85	Very limited		Somewhat limited		Very limited	
		Frost action	1.00	Flooding	0.80	Flooding	1.00
		Flooding	1.00	Depth to saturated zone	0.61		
		Low strength	1.00	Cutbanks cave	0.10		
		Shrink-swell	0.50				

Table 12b.--Building Site Development--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
5736:							
Obert, frequently flooded	80	Very limited		Very limited		Very limited	
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Flooding	1.00
		Frost action	1.00	Flooding	0.80	Depth to saturated zone	1.00
		Flooding	1.00	Cutbanks cave	0.10		
		Low strength	1.00				
5742:							
Obert, occasionally flooded	86	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Frost action	1.00	Flooding	0.60	Flooding	0.60
		Flooding	1.00	Cutbanks cave	0.10		
		Low strength	1.00				
		Shrink-swell	0.50				
5780:							
Olmitz	85	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Cutbanks cave	0.10		
		Shrink-swell	0.50				
		Frost action	0.50				
6046:							
Pawnee	80	Very limited		Very limited		Somewhat limited	
		Frost action	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.19
		Low strength	1.00	Too clayey	0.18	Slope	0.04
		Shrink-swell	1.00	Cutbanks cave	0.10		
		Depth to saturated zone	0.19	Slope	0.04		
		Slope	0.04				
6130:							
Platte, occasionally flooded	80	Very limited		Very limited		Somewhat limited	
		Flooding	1.00	Depth to saturated zone	1.00	Flooding	0.60
		Frost action	0.50	Cutbanks cave	1.00	Depth to saturated zone	0.19
		Depth to saturated zone	0.19	Flooding	0.60	Droughty	0.17
6138:							
Platte, frequently flooded	50	Very limited		Very limited		Very limited	
		Flooding	1.00	Depth to saturated zone	1.00	Flooding	1.00
		Frost action	0.50	Cutbanks cave	1.00	Depth to saturated zone	0.19
		Depth to saturated zone	0.19	Flooding	0.80	Droughty	0.17
Barney, frequently flooded, channeled	46	Very limited		Very limited		Very limited	
		Flooding	1.00	Depth to saturated zone	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Cutbanks cave	1.00	Depth to saturated zone	1.00
		Frost action	0.50	Flooding	0.80	Droughty	0.42
				Depth to dense layer	0.50		

Table 12b.--Building Site Development--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets: Rating class and limiting features	Value	Shallow excavations: Rating class and limiting features	Value	Lawns and landscaping: Rating class and limiting features	Value
6160:							
Pohocco	80	Very limited		Somewhat limited		Not limited	
		Frost action	1.00	Cutbanks cave	0.10		
		Low strength	1.00				
		Shrink-swell	0.50				
6162:							
Pohocco	80	Very limited		Somewhat limited		Somewhat limited	
		Frost action	1.00	Slope	0.96	Slope	0.96
		Low strength	1.00	Cutbanks cave	0.10		
		Slope	0.96				
		Shrink-swell	0.50				
6170:							
Pohocco	52	Very limited		Somewhat limited		Not limited	
		Frost action	1.00	Cutbanks cave	0.10		
		Low strength	1.00				
		Shrink-swell	0.50				
Pahuk	45	Not limited		Very limited		Somewhat limited	
				Cutbanks cave	1.00	Droughty	0.64
6172:							
Pohocco	59	Very limited		Somewhat limited		Somewhat limited	
		Frost action	1.00	Slope	0.96	Slope	0.96
		Low strength	1.00	Cutbanks cave	0.10		
		Slope	0.96				
		Shrink-swell	0.50				
Pahuk	35	Somewhat limited		Very limited		Somewhat limited	
		Slope	0.96	Cutbanks cave	1.00	Slope	0.96
				Slope	0.96	Droughty	0.64
6520:							
Saltillo, occasionally flooded	85	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Sodium content	1.00
						Depth to saturated zone	1.00
		Frost action	1.00	Flooding	0.60		
		Flooding	1.00	Cutbanks cave	0.10	Salinity	1.00
		Shrink-swell	0.50			Flooding	0.60
6791:							
Scott	100	Very limited		Very limited		Very limited	
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Frost action	1.00	Too clayey	0.32		
		Shrink-swell	1.00	Cutbanks cave	0.10		
7069:							
Steinauer	85	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Low strength	1.00	Cutbanks cave	0.10		
		Shrink-swell	0.50				
		Frost action	0.50				
7290:							
Tomek	86	Very limited		Somewhat limited		Not limited	
		Shrink-swell	1.00	Cutbanks cave	0.10		
		Frost action	0.50				

Table 12b.--Building Site Development--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets: Rating class and limiting features	Value	Shallow excavations: Rating class and limiting features	Value	Lawns and landscaping: Rating class and limiting features	Value
7920:							
Wann, occasionally flooded-----------	92	Very limited		Very limited		Somewhat limited	
		Frost action	1.00	Cutbanks cave	1.00	Flooding	0.60
		Flooding	1.00	Depth to saturated zone	1.00		
				Flooding	0.60		
8120:							
Yutan---------------	88	Very limited		Somewhat limited		Somewhat limited	
		Frost action	1.00	Slope	0.96	Slope	0.96
		Low strength	1.00	Cutbanks cave	0.10		
		Slope	0.96				
		Shrink-swell	0.50				
8124:							
Yutan---------------	92	Very limited		Somewhat limited		Not limited	
		Frost action	1.00	Cutbanks cave	0.10		
		Low strength	1.00				
		Shrink-swell	0.50				
8130:							
Yutan---------------	65	Very limited		Somewhat limited		Not limited	
		Frost action	1.00	Cutbanks cave	0.10		
		Low strength	1.00				
		Shrink-swell	0.50				
Aksarben------------	33	Very limited		Somewhat limited		Not limited	
		Frost action	1.00	Cutbanks cave	0.10		
		Shrink-swell	0.50				
8134:							
Yutan---------------	64	Very limited		Somewhat limited		Not limited	
		Frost action	1.00	Cutbanks cave	0.10		
		Low strength	1.00				
		Shrink-swell	0.50				
Judson--------------	25	Very limited		Somewhat limited		Not limited	
		Frost action	1.00	Cutbanks cave	0.10		
		Low strength	1.00				
		Shrink-swell	0.50				
9900:							
Arents, earthen dam-	100	Not rated		Not rated		Not rated	
9985:							
Gravel pits---------	100	Not rated		Not rated		Not rated	
9998:							
Water---------------	100	Not rated		Not rated		Not rated	

Table 13a.--Sanitary Facilities

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields: Rating class and limiting features	Value	Sewage lagoons: Rating class and limiting features	Value
1050:					
Aksarben	98	Very limited		Somewhat limited	
		Restricted permeability	1.00	Seepage	0.50
1100:					
Alda, occasionally flooded	85	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Seepage	1.00
		Filtering capacity	1.00	Depth to saturated zone	1.00
1347:					
Barney, frequently flooded	87	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Seepage	1.00
		Filtering capacity	1.00	Depth to saturated zone	1.00
1616:					
Boel, occasionally flooded	85	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Seepage	1.00
		Filtering capacity	1.00	Depth to saturated zone	1.00
1873:					
Burchard	50	Very limited		Very limited	
		Restricted permeability	1.00	Slope	1.00
		Slope	0.04		
Steinauer	35	Very limited		Very limited	
		Restricted permeability	1.00	Slope	1.00
		Slope	0.04		
1879:					
Burchard	45	Very limited		Very limited	
		Restricted permeability	1.00	Slope	1.00
		Slope	1.00		
Steinauer	40	Very limited		Very limited	
		Restricted permeability	1.00	Slope	1.00
		Slope	0.96		

Table 13a.--Sanitary Facilities--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields: Rating class and limiting features	Value	Sewage lagoons: Rating class and limiting features	Value
2420:					
Deroin, severely eroded------------	90	Very limited		Very limited	
		Restricted permeability	1.00	Slope	1.00
2830:					
Filbert------------	90	Very limited		Somewhat limited	
		Restricted permeability	1.00	Seepage	0.50
		Depth to saturated zone	1.00		
2844:					
Fillmore------------	90	Very limited		Very limited	
		Restricted permeability	1.00	Ponding	1.00
				Seepage	0.50
		Ponding	1.00		
		Depth to saturated zone	1.00		
2863:					
Fluvaquents---------	95	Very limited		Very limited	
		Flooding	1.00	Ponding	1.00
		Ponding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Filtering capacity	1.00	Seepage	1.00
3025:					
Gibbon, occasionally flooded-----------	95	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Restricted permeability	0.50	Seepage	0.50
3038:					
Gibbon, occasionally flooded-----------	50	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Restricted permeability	0.50	Seepage	0.50
Saltine, occasionally flooded-----------	38	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Restricted permeability	1.00	Seepage	0.50

Table 13a.--Sanitary Facilities--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields: Rating class and limiting features	Value	Sewage lagoons: Rating class and limiting features	Value
3421:					
Hedville	80	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Slope	1.00
				Seepage	0.50
3830:					
Ida	60	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Restricted permeability	0.50	Seepage	0.50
Steinauer	30	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Restricted permeability	1.00		
3890:					
Inglewood, rarely flooded	85	Very limited		Very limited	
		Filtering capacity	1.00	Seepage	1.00
		Depth to saturated zone	0.84	Flooding	0.40
		Flooding	0.40	Depth to saturated zone	0.17
4104:					
Judson	85	Somewhat limited		Somewhat limited	
		Restricted permeability	0.50	Seepage	0.50
4106:					
Judson	90	Somewhat limited		Somewhat limited	
		Restricted permeability	0.50	Seepage	0.50
				Slope	0.08
4250:					
Kenridge, occasionally flooded	92	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Restricted permeability	1.00	Depth to saturated zone	0.17
		Depth to saturated zone	0.84		
4404:					
Lamo, occasionally flooded	96	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Restricted permeability	1.00		

Table 13a.--Sanitary Facilities--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
4583:					
Lex, occasionally flooded	94	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Seepage	1.00
		Filtering capacity	1.00	Depth to saturated zone	1.00
		Restricted permeability	0.68		
4853:					
Malcolm	85	Somewhat limited		Very limited	
		Restricted permeability	0.50	Slope	1.00
				Seepage	0.50
4860:					
Malmo, severely eroded	85	Very limited		Very limited	
		Restricted permeability	1.00	Slope	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	0.25
		Slope	0.04		
5388:					
Morrill	89	Very limited		Very limited	
		Restricted permeability	1.00	Seepage	1.00
		Slope	0.04	Slope	1.00
5480:					
Muscotah, occasionally flooded	90	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Restricted permeability	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00		
5540:					
Nodaway, occasionally flooded	90	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	0.71
		Restricted permeability	0.50	Seepage	0.50
5541:					
Nodaway, channeled	85	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	0.71
		Restricted permeability	0.50	Seepage	0.50

Table 13a.--Sanitary Facilities--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
5736:					
Obert, frequently flooded-----------	80	Very limited		Very limited	
		Flooding	1.00	Ponding	1.00
		Ponding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Restricted permeability	1.00	Seepage	0.32
5742:					
Obert, occasionally flooded-----------	86	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Restricted permeability	1.00	Seepage	0.32
5780:					
Olmitz--------------	85	Somewhat limited		Somewhat limited	
		Restricted permeability	0.50	Seepage	0.50
				Slope	0.08
6046:					
Pawnee--------------	80	Very limited		Very limited	
		Restricted permeability	1.00	Slope	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	0.25
		Slope	0.04		
6130:					
Platte, occasionally flooded-----------	80	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Seepage	1.00
		Filtering capacity	1.00	Depth to saturated zone	1.00
6138:					
Platte, frequently flooded-----------	50	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Seepage	1.00
		Filtering capacity	1.00	Depth to saturated zone	1.00
Barney, frequently flooded, channeled-	46	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Seepage	1.00
		Filtering capacity	1.00	Depth to saturated zone	1.00
6160:					
Pohocco-------------	80	Somewhat limited		Very limited	
		Restricted permeability	0.50	Slope	1.00
				Seepage	0.50

Table 13a.--Sanitary Facilities--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields: Rating class and limiting features	Value	Sewage lagoons: Rating class and limiting features	Value
6162:					
Pohocco	80	Somewhat limited		Very limited	
		Slope	0.96	Slope	1.00
		Restricted permeability	0.50	Seepage	0.50
6170:					
Pohocco	52	Somewhat limited		Very limited	
		Restricted permeability	0.50	Slope	1.00
				Seepage	0.50
Pahuk	45	Very limited		Very limited	
		Filtering capacity	1.00	Seepage	1.00
				Slope	1.00
6172:					
Pohocco	59	Somewhat limited		Very limited	
		Slope	0.96	Slope	1.00
		Restricted permeability	0.50	Seepage	0.50
Pahuk	35	Very limited		Very limited	
		Filtering capacity	1.00	Slope	1.00
		Slope	0.96	Seepage	1.00
6520:					
Saltillo, occasionally flooded	85	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Restricted permeability	0.50	Seepage	0.50
6791:					
Scott	100	Very limited		Very limited	
		Restricted permeability	1.00	Ponding	1.00
		Ponding	1.00	Seepage	0.50
		Depth to saturated zone	1.00		
7069:					
Steinauer	85	Very limited		Very limited	
		Restricted permeability	1.00	Slope	1.00
		Slope	1.00		
7290:					
Tomek	86	Very limited		Somewhat limited	
		Restricted permeability	1.00	Seepage	0.01
7920:					
Wann, occasionally flooded	92	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Seepage	1.00
				Depth to saturated zone	1.00

Table 13a.--Sanitary Facilities--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
8120:					
Yutan	88	Very limited		Very limited	
		Restricted permeability	1.00	Slope	1.00
		Slope	0.96	Seepage	0.50
8124:					
Yutan	92	Very limited		Somewhat limited	
		Restricted permeability	1.00	Seepage	0.50
				Slope	0.32
8130:					
Yutan	65	Very limited		Somewhat limited	
		Restricted permeability	1.00	Seepage	0.50
				Slope	0.32
Aksarben	33	Very limited		Somewhat limited	
		Restricted permeability	1.00	Seepage	0.50
				Slope	0.32
8134:					
Yutan	64	Very limited		Very limited	
		Restricted permeability	1.00	Slope	1.00
				Seepage	0.50
Judson	25	Somewhat limited		Very limited	
		Restricted permeability	0.50	Slope	1.00
				Seepage	0.50
9900:					
Arents, earthen dam	100	Not rated		Not rated	
9985:					
Gravel pits	100	Not rated		Not rated	
9998:					
Water	100	Not rated		Not rated	

Table 13b.--Sanitary Facilities

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1050:							
Aksarben	98	Somewhat limited		Not limited		Somewhat limited	
		Too clayey	0.50			Too clayey	0.50
1100:							
Alda, occasionally flooded	85	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Too sandy	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Seepage	1.00
		Seepage	1.00	Seepage	1.00	Depth to saturated zone	0.68
		Too sandy	1.00				
1347:							
Barney, frequently flooded	87	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Too sandy	1.00
		Seepage	1.00	Seepage	1.00	Seepage	1.00
		Too sandy	1.00				
1616:							
Boel, occasionally flooded	85	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Too sandy	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Seepage	1.00
		Seepage	1.00	Seepage	1.00	Depth to saturated zone	0.68
		Too sandy	1.00				
1873:							
Burchard	50	Somewhat limited		Somewhat limited		Somewhat limited	
		Too clayey	0.50	Slope	0.04	Too clayey	0.50
		Slope	0.04			Slope	0.04
Steinauer	35	Somewhat limited		Somewhat limited		Somewhat limited	
		Too clayey	0.50	Slope	0.04	Too clayey	0.50
		Slope	0.04			Slope	0.04
1879:							
Burchard	45	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Too clayey	0.50			Too clayey	0.50
Steinauer	40	Somewhat limited		Somewhat limited		Somewhat limited	
		Slope	0.96	Slope	0.96	Slope	0.96
		Too clayey	0.50			Too clayey	0.50
2420:							
Deroin, severely eroded	90	Somewhat limited		Not limited		Somewhat limited	
		Too clayey	0.50			Too clayey	0.50

Table 13b.--Sanitary Facilities--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill: Rating class and limiting features	Value	Area sanitary landfill: Rating class and limiting features	Value	Daily cover for landfill: Rating class and limiting features	Value
2830:							
Filbert-------------	90	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Too clayey	1.00			Too clayey	1.00
						Hard to compact	1.00
2844:							
Fillmore------------	90	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Ponding	1.00	Ponding	1.00
		Ponding	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Too clayey	1.00			Too clayey	1.00
						Hard to compact	1.00
2863:							
Fluvaquents---------	95	Not rated		Not rated		Not rated	
3025:							
Gibbon, occasionally flooded------------	95	Very limited		Very limited		Somewhat limited	
		Flooding	1.00	Flooding	1.00	Depth to saturated zone	0.68
		Depth to saturated zone	1.00	Depth to saturated zone	1.00		
3038:							
Gibbon, occasionally flooded------------	50	Very limited		Very limited		Somewhat limited	
		Flooding	1.00	Flooding	1.00	Depth to saturated zone	0.68
		Depth to saturated zone	1.00	Depth to saturated zone	1.00		
Saltine, occasionally flooded------------	38	Very limited		Very limited		Somewhat limited	
		Flooding	1.00	Flooding	1.00	Depth to saturated zone	0.68
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Too clayey	0.50
		Sodium content	1.00				
		Too clayey	0.50				
3421:							
Hedville------------	80	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Slope	1.00	Slope	1.00	Slope	1.00
3830:							
Ida-----------------	60	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
Steinauer-----------	30	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Too clayey	0.50			Too clayey	0.50
3890:							
Inglewood, rarely flooded------------	85	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Too sandy	1.00
		Seepage	1.00	Seepage	1.00	Seepage	1.00
		Too sandy	1.00	Flooding	0.40		
		Flooding	0.40				

Table 13b.--Sanitary Facilities--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
4104:							
Judson	85	Somewhat limited		Not limited		Somewhat limited	
		Too clayey	0.50			Too clayey	0.50
4106:							
Judson	90	Somewhat limited		Not limited		Somewhat limited	
		Too clayey	0.50			Too clayey	0.50
4250:							
Kenridge, occasionally flooded	92	Very limited		Very limited		Somewhat limited	
		Flooding	1.00	Flooding	1.00	Too clayey	0.50
		Depth to saturated zone	1.00	Depth to saturated zone	1.00		
		Too clayey	0.50				
4404:							
Lamo, occasionally flooded	96	Very limited		Very limited		Somewhat limited	
		Flooding	1.00	Flooding	1.00	Depth to saturated zone	0.86
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Too clayey	0.50
		Too clayey	0.50				
4583:							
Lex, occasionally flooded	94	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Too sandy	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Seepage	1.00
		Seepage	1.00	Seepage	1.00	Depth to saturated zone	0.86
		Too sandy	1.00				
4853:							
Malcolm	85	Not limited		Not limited		Not limited	
4860:							
Malmo, severely eroded	85	Very limited		Somewhat limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	0.75	Too clayey	1.00
		Slope	0.04	Slope	0.04	Depth to saturated zone	0.86
						Slope	0.04
5388:							
Morrill	89	Very limited		Somewhat limited		Somewhat limited	
		Seepage	1.00	Slope	0.04	Seepage	0.50
		Too sandy	1.00			Too sandy	0.50
		Slope	0.04			Slope	0.04
5480:							
Muscotah, occasionally flooded	90	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Too clayey	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Hard to compact	1.00
		Too clayey	1.00			Depth to saturated zone	0.68

Table 13b.--Sanitary Facilities--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
5540:							
Nodaway, occasionally flooded-----------	90	Very limited		Very limited		Not limited	
		Flooding	1.00	Flooding	1.00		
		Depth to saturated zone	1.00	Depth to saturated zone	1.00		
5541:							
Nodaway, channeled--	85	Very limited		Very limited		Not limited	
		Flooding	1.00	Flooding	1.00		
		Depth to saturated zone	1.00	Depth to saturated zone	1.00		
5736:							
Obert, frequently flooded-----------	80	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Ponding	1.00	Depth to saturated zone	1.00
		Ponding	1.00	Depth to saturated zone	1.00	Too clayey	0.50
		Too clayey	0.50				
5742:							
Obert, occasionally flooded-----------	86	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Too clayey	0.50
		Too clayey	0.50				
5780:							
Olmitz--------------	85	Somewhat limited		Not limited		Somewhat limited	
		Too clayey	0.50			Too clayey	0.50
6046:							
Pawnee--------------	80	Very limited		Somewhat limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	0.75	Too clayey	1.00
		Too clayey	0.50	Slope	0.04	Depth to saturated zone	0.86
		Slope	0.04			Slope	0.04
6130:							
Platte, occasionally flooded-----------	80	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Too sandy	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Seepage	1.00
		Seepage	1.00	Seepage	1.00	Depth to saturated zone	0.86
		Too sandy	1.00				
6138:							
Platte, frequently flooded-----------	50	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Too sandy	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Seepage	1.00
		Seepage	1.00	Seepage	1.00	Depth to saturated zone	0.86
		Too sandy	1.00				

Table 13b.--Sanitary Facilities--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill: Rating class and limiting features	Value	Area sanitary landfill: Rating class and limiting features	Value	Daily cover for landfill: Rating class and limiting features	Value
6138:							
Barney, frequently flooded, channeled	46	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Too sandy	1.00
		Seepage	1.00	Seepage	1.00	Seepage	1.00
		Too sandy	1.00				
6160:							
Pohocco	80	Not limited		Not limited		Not limited	
6162:							
Pohocco	80	Somewhat limited		Somewhat limited		Somewhat limited	
		Slope	0.96	Slope	0.96	Slope	0.96
6170:							
Pohocco	52	Not limited		Not limited		Not limited	
Pahuk	45	Very limited		Very limited		Very limited	
		Seepage	1.00	Seepage	1.00	Too sandy	1.00
		Too sandy	1.00			Seepage	1.00
6172:							
Pohocco	59	Somewhat limited		Somewhat limited		Somewhat limited	
		Slope	0.96	Slope	0.96	Slope	0.96
Pahuk	35	Very limited		Very limited		Very limited	
		Seepage	1.00	Seepage	1.00	Too sandy	1.00
		Too sandy	1.00	Slope	0.96	Seepage	1.00
		Slope	0.96			Slope	0.96
6520:							
Saltillo, occasionally flooded	85	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Sodium content	1.00
		Sodium content	1.00				
		Salinity	1.00				
6791:							
Scott	100	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Ponding	1.00	Ponding	1.00
		Ponding	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Too clayey	1.00			Too clayey	1.00
						Hard to compact	1.00
7069:							
Steinauer	85	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Too clayey	0.50			Too clayey	0.50
7290:							
Tomek	86	Somewhat limited		Not limited		Very limited	
		Too clayey	0.50			Hard to compact	1.00
						Too clayey	0.50

Table 13b.--Sanitary Facilities--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
7920:							
Wann, occasionally flooded-----------	92	Very limited		Very limited		Somewhat limited	
		Flooding	1.00	Flooding	1.00	Seepage	0.50
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.44
		Seepage	1.00	Seepage	1.00		
8120:							
Yutan--------------	88	Somewhat limited		Somewhat limited		Somewhat limited	
		Slope	0.96	Slope	0.96	Slope	0.96
8124:							
Yutan--------------	92	Not limited		Not limited		Not limited	
8130:							
Yutan--------------	65	Not limited		Not limited		Not limited	
Aksarben-----------	33	Somewhat limited		Not limited		Somewhat limited	
		Too clayey	0.50			Too clayey	0.50
8134:							
Yutan--------------	64	Not limited		Not limited		Not limited	
Judson--------------	25	Somewhat limited		Not limited		Somewhat limited	
		Too clayey	0.50			Too clayey	0.50
9900:							
Arents, earthen dam-	100	Not rated		Not rated		Not rated	
9985:							
Gravel pits---------	100	Not rated		Not rated		Not rated	
9998:							
Water--------------	100	Not rated		Not rated		Not rated	

Table 14a.--Agricultural Waste Management

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Application of manure and food-processing waste: Rating class and limiting features	Value	Application of sewage sludge: Rating class and limiting features	Value	Disposal of wastewater by irrigation: Rating class and limiting features	Value
1050:							
Aksarben------------	98	Somewhat limited		Somewhat limited		Somewhat limited	
		Restricted permeability	0.30	Too acid	0.42	Too acid	0.42
		Too acid	0.11	Restricted permeability	0.22	Restricted permeability	0.22
1100:							
Alda, occasionally flooded------------	85	Very limited		Very limited		Very limited	
		Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
		Depth to saturated zone	0.95	Flooding	1.00	Depth to saturated zone	0.95
		Flooding	0.60	Depth to saturated zone	0.95	Flooding	0.60
1347:							
Barney, frequently flooded------------	87	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Depth to dense layer	1.00	Filtering capacity	1.00	Filtering capacity	1.00
		Filtering capacity	1.00	Droughty	0.60	Droughty	0.60
		Droughty	0.60				
1616:							
Boel, occasionally flooded------------	85	Very limited		Very limited		Very limited	
		Filtering capacity	1.00	Flooding	1.00	Filtering capacity	1.00
		Depth to saturated zone	0.95	Filtering capacity	1.00	Depth to saturated zone	0.95
		Flooding	0.60	Depth to saturated zone	0.95	Flooding	0.60
		Leaching	0.45	Droughty	0.14	Droughty	0.14
		Droughty	0.14				
1873:							
Burchard------------	50	Somewhat limited		Somewhat limited		Very limited	
		Restricted permeability	0.30	Restricted permeability	0.22	Too steep for surface application	1.00
		Slope	0.04	Slope	0.04	Too steep for sprinkler application	0.22
						Restricted permeability	0.22

Table 14a.--Agricultural Waste Management--Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food-processing waste: Rating class and limiting features	Value	Application of sewage sludge: Rating class and limiting features	Value	Disposal of wastewater by irrigation: Rating class and limiting features	Value
1873:							
Steinauer-----------	35	Somewhat limited		Somewhat limited		Very limited	
		Restricted permeability	0.30	Restricted permeability	0.22	Too steep for surface application	1.00
		Slope	0.04	Slope	0.04	Too steep for sprinkler application	0.22
						Restricted permeability	0.22
1879:							
Burchard------------	45	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Too steep for surface application	1.00
		Restricted permeability	0.30	Restricted permeability	0.22	Too steep for sprinkler application	1.00
						Restricted permeability	0.22
Steinauer-----------	40	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.96	Slope	0.96	Too steep for surface application	1.00
		Restricted permeability	0.30	Restricted permeability	0.22	Too steep for sprinkler application	0.98
						Restricted permeability	0.22
2420:							
Deroin, severely eroded-------------	90	Somewhat limited		Somewhat limited		Very limited	
		Restricted permeability	0.41	Too acid	0.31	Too steep for surface application	1.00
		Too acid	0.08	Restricted permeability	0.31	Too acid	0.31
						Restricted permeability	0.31
						Too steep for sprinkler application	0.10
2830:							
Filbert-------------	90	Very limited		Very limited		Very limited	
		Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Runoff	0.40	Too acid	0.91	Too acid	0.91
		Too acid	0.32				

Table 14a.--Agricultural Waste Management--Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food-processing waste: Rating class and limiting features	Value	Application of sewage sludge: Rating class and limiting features	Value	Disposal of wastewater by irrigation: Rating class and limiting features	Value
2844:							
Fillmore------------	90	Very limited		Very limited		Very limited	
		Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Runoff	0.40	Too acid	0.42	Too acid	0.42
		Too acid	0.11				
2863:							
Fluvaquents---------	95	Very limited		Very limited		Very limited	
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
		Runoff	0.40				
3025:							
Gibbon, occasionally flooded-----------	95	Somewhat limited		Very limited		Somewhat limited	
		Depth to saturated zone	0.95	Flooding	1.00	Depth to saturated zone	0.95
		Flooding	0.60	Depth to saturated zone	0.95	Flooding	0.60
3038:							
Gibbon, occasionally flooded-----------	50	Somewhat limited		Very limited		Somewhat limited	
		Depth to saturated zone	0.95	Flooding	1.00	Depth to saturated zone	0.95
		Flooding	0.60	Depth to saturated zone	0.95	Flooding	0.60
Saltine, occasionally flooded------------	38	Very limited		Very limited		Very limited	
		Sodium content	1.00	Flooding	1.00	Sodium content	1.00
		Depth to saturated zone	0.95	Sodium content	1.00	Depth to saturated zone	0.95
		Flooding	0.60	Depth to saturated zone	0.95	Flooding	0.60
		Salinity	0.50	Restricted permeability	0.22	Restricted permeability	0.22
		Restricted permeability	0.30	Salinity	0.01	Salinity	0.01
3421:							
Hedville------------	80	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Droughty	1.00	Droughty	1.00
		Droughty	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Slope	1.00	Slope	1.00	Too steep for surface application	1.00
		Runoff	0.40	Cobble content	0.12	Too steep for sprinkler application	1.00
		Cobble content	0.12			Cobble content	0.12

Table 14a.--Agricultural Waste Management--Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food-processing waste: Rating class and limiting features	Value	Application of sewage sludge: Rating class and limiting features	Value	Disposal of wastewater by irrigation: Rating class and limiting features	Value
3830:							
Ida	60	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Too steep for surface application	1.00
						Too steep for sprinkler application	1.00
Steinauer	30	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Too steep for surface application	1.00
		Restricted permeability	0.30	Restricted permeability	0.22	Too steep for sprinkler application	1.00
						Restricted permeability	0.22
3890:							
Inglewood, rarely flooded	85	Very limited		Very limited		Very limited	
		Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
		Leaching	0.45	Flooding	0.40		
4104:							
Judson	85	Not limited		Not limited		Not limited	
4106:							
Judson	90	Not limited		Not limited		Not limited	
4250:							
Kenridge, occasionally flooded	92	Somewhat limited		Very limited		Somewhat limited	
		Flooding	0.60	Flooding	1.00	Flooding	0.60
		Restricted permeability	0.30	Restricted permeability	0.22	Restricted permeability	0.22
		Too acid	0.03	Too acid	0.14	Too acid	0.14
4404:							
Lamo, occasionally flooded	96	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Flooding	1.00	Depth to saturated zone	1.00
		Flooding	0.60	Depth to saturated zone	1.00	Flooding	0.60
		Restricted permeability	0.30	Restricted permeability	0.22	Restricted permeability	0.22
4583:							
Lex, occasionally flooded	94	Very limited		Very limited		Very limited	
		Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
		Depth to saturated zone	1.00	Flooding	1.00	Depth to saturated zone	1.00
		Flooding	0.60	Depth to saturated zone	1.00	Flooding	0.60

Table 14a.--Agricultural Waste Management--Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food-processing waste: Rating class and limiting features	Value	Application of sewage sludge: Rating class and limiting features	Value	Disposal of wastewater by irrigation: Rating class and limiting features	Value
4853: Malcolm-------------	85	Somewhat limited Too acid	 0.03	Somewhat limited Too acid	 0.14	Very limited Too steep for surface application Too acid Too steep for sprinkler application	 1.00 0.14 0.10
4860: Malmo, severely eroded------------	85	Very limited Restricted permeability Depth to saturated zone Runoff Slope Too acid	 1.00 1.00 0.40 0.04 0.03	Very limited Restricted permeability Depth to saturated zone Too acid Slope	 1.00 1.00 0.14 0.04	Very limited Restricted permeability Too steep for surface application Depth to saturated zone Too steep for sprinkler application Too acid	 1.00 1.00 1.00 0.22 0.14
5388: Morrill-------------	89	Somewhat limited Restricted permeability Too acid Slope Filtering capacity	 0.50 0.50 0.04 0.01	Very limited Too acid Restricted permeability Slope Filtering capacity	 1.00 0.37 0.04 0.01	Very limited Too steep for surface application Too acid Restricted permeability Too steep for sprinkler application Filtering capacity	 1.00 1.00 0.37 0.22 0.01
5480: Muscotah, occasionally flooded------------	90	Very limited Restricted permeability Depth to saturated zone Flooding Runoff	 1.00 0.95 0.60 0.40	Very limited Restricted permeability Flooding Depth to saturated zone	 1.00 1.00 0.95	Very limited Restricted permeability Depth to saturated zone Flooding	 1.00 0.95 0.60
5540: Nodaway, occasionally flooded------------	90	Somewhat limited Flooding	 0.60	Very limited Flooding	 1.00	Somewhat limited Flooding	 0.60
5541: Nodaway, channeled--	85	Very limited Flooding	 1.00	Very limited Flooding	 1.00	Very limited Flooding	 1.00

Table 14a.--Agricultural Waste Management--Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food-processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
5736:							
Obert, frequently flooded-----------	80	Very limited		Very limited		Very limited	
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Runoff	0.40	Restricted permeability	0.22	Restricted permeability	0.22
		Restricted permeability	0.30				
5742:							
Obert, occasionally flooded-----------	86	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Flooding	0.60	Flooding	1.00	Flooding	0.60
		Runoff	0.40	Restricted permeability	0.22	Restricted permeability	0.22
		Restricted permeability	0.30				
5780:							
Olmitz--------------	85	Not limited		Not limited		Not limited	
6046:							
Pawnee--------------	80	Very limited		Very limited		Very limited	
		Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Too steep for surface application	1.00
		Runoff	0.40	Slope	0.04	Depth to saturated zone	1.00
		Slope	0.04			Too steep for sprinkler application	0.22
6130:							
Platte, occasionally flooded-----------	80	Very limited		Very limited		Very limited	
		Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
		Depth to saturated zone	1.00	Flooding	1.00	Depth to saturated zone	1.00
		Flooding	0.60	Depth to saturated zone	1.00	Flooding	0.60
		Droughty	0.39	Droughty	0.39	Droughty	0.39
6138:							
Platte, frequently flooded-----------	50	Very limited		Very limited		Very limited	
		Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Droughty	0.39	Droughty	0.39	Droughty	0.39

Table 14a.--Agricultural Waste Management--Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food-processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
6138:							
Barney, frequently flooded, channeled	46	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Depth to dense layer	1.00	Filtering capacity	1.00	Filtering capacity	1.00
		Filtering capacity	1.00	Droughty	0.60	Droughty	0.60
		Droughty	0.60				
6160:							
Pohocco	80	Not limited		Not limited		Very limited	
						Too steep for surface application	1.00
						Too steep for sprinkler application	0.10
6162:							
Pohocco	80	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.96	Slope	0.96	Too steep for surface application	1.00
						Too steep for sprinkler application	0.98
6170:							
Pohocco	52	Not limited		Not limited		Very limited	
						Too steep for surface application	1.00
						Too steep for sprinkler application	0.10
Pahuk	45	Very limited		Very limited		Very limited	
		Filtering capacity	1.00	Filtering capacity	1.00	Too steep for surface application	1.00
		Leaching	0.45	Droughty	0.10	Filtering capacity	1.00
		Droughty	0.10			Too steep for sprinkler application	0.10
						Droughty	0.10
6172:							
Pohocco	59	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.96	Slope	0.96	Too steep for surface application	1.00
						Too steep for sprinkler application	0.98

Table 14a.--Agricultural Waste Management--Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food-processing waste: Rating class and limiting features	Value	Application of sewage sludge: Rating class and limiting features	Value	Disposal of wastewater by irrigation: Rating class and limiting features	Value
6172:							
Pahuk	35	Very limited		Very limited		Very limited	
		Filtering capacity	1.00	Filtering capacity	1.00	Too steep for surface application	1.00
		Slope	0.96	Slope	0.96	Filtering capacity	1.00
		Leaching	0.45	Droughty	0.10	Too steep for sprinkler application	0.98
		Droughty	0.10			Droughty	0.10
6520:							
Saltillo, occasionally flooded	85	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Sodium content	1.00	Flooding	1.00	Sodium content	1.00
		Salinity	1.00	Sodium content	1.00	Salinity	1.00
		Flooding	0.60	Salinity	1.00	Flooding	0.60
6791:							
Scott	100	Very limited		Very limited		Very limited	
		Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Runoff	0.40	Too acid	0.42	Too acid	0.42
		Too acid	0.11				
7069:							
Steinauer	85	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Too steep for surface application	1.00
		Restricted permeability	0.30	Restricted permeability	0.22	Too steep for sprinkler application	1.00
						Restricted permeability	0.22
7290:							
Tomek	86	Somewhat limited		Somewhat limited		Somewhat limited	
		Restricted permeability	0.41	Restricted permeability	0.31	Restricted permeability	0.31
7920:							
Wann, occasionally flooded	92	Somewhat limited		Very limited		Somewhat limited	
		Depth to saturated zone	0.84	Flooding	1.00	Depth to saturated zone	0.84
		Flooding	0.60	Depth to saturated zone	0.84	Flooding	0.60
		Sodium content	0.08	Sodium content	0.08	Sodium content	0.08
		Filtering capacity	0.01	Filtering capacity	0.01	Filtering capacity	0.01

Table 14a.--Agricultural Waste Management--Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food-processing waste: Rating class and limiting features	Value	Application of sewage sludge: Rating class and limiting features	Value	Disposal of wastewater by irrigation: Rating class and limiting features	Value
8120:							
Yutan	88	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.96	Slope	0.96	Too steep for surface application	1.00
		Restricted permeability	0.30	Too acid	0.42	Too steep for sprinkler application	0.98
		Too acid	0.11	Restricted permeability	0.22	Too acid	0.42
						Restricted permeability	0.22
8124:							
Yutan	92	Somewhat limited		Somewhat limited		Somewhat limited	
		Restricted permeability	0.30	Too acid	0.42	Too acid	0.42
		Too acid	0.11	Restricted permeability	0.22	Restricted permeability	0.22
						Too steep for surface application	0.08
8130:							
Yutan	65	Somewhat limited		Somewhat limited		Somewhat limited	
		Restricted permeability	0.30	Too acid	0.42	Too acid	0.42
		Too acid	0.11	Restricted permeability	0.22	Restricted permeability	0.22
						Too steep for surface application	0.08
Aksarben	33	Somewhat limited		Somewhat limited		Somewhat limited	
		Restricted permeability	0.30	Too acid	0.42	Too acid	0.42
		Too acid	0.11	Restricted permeability	0.22	Restricted permeability	0.22
						Too steep for surface application	0.08
8134:							
Yutan	64	Somewhat limited		Somewhat limited		Very limited	
		Restricted permeability	0.30	Too acid	0.42	Too steep for surface application	1.00
		Too acid	0.11	Restricted permeabiity	0.22	Too acid	0.42
						Restricted permeability	0.22
						Too steep for sprinkler application	0.10
Judson	25	Not limited		Not limited		Very limited	
						Too steep for surface application	1.00
						Too steep for sprinkler application	0.10

Table 14a.--Agricultural Waste Management--Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food-processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
9900:							
Arents, earthen dam-	100	Not rated		Not rated		Not rated	
9985:							
Gravel pits----------	100	Not rated		Not rated		Not rated	
9998:							
Water---------------	100	Not rated		Not rated		Not rated	

Table 14b.--Agricultural Waste Management

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Overland flow of wastewater: Rating class and limiting features	Value	Rapid infiltration of wastewater: Rating class and limiting features	Value	Slow rate treatment of wastewater: Rating class and limiting features	Value
1050:							
Aksarben	98	Very limited		Very limited		Somewhat limited	
		Seepage	1.00	Restricted permeability	1.00	Too acid	0.42
		Too acid	0.42			Restricted permeability	0.15
1100:							
Alda, occasionally flooded	85	Very limited		Very limited		Very limited	
		Flooding	1.00	Depth to saturated zone	1.00	Filtering capacity	1.00
		Seepage	1.00	Restricted permeability	1.00	Depth to saturated zone	0.95
		Depth to saturated zone	0.95	Flooding	0.60	Flooding	0.60
1347:							
Barney, frequently flooded	87	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Depth to saturated zone	1.00
		Seepage	1.00	Depth to saturated zone	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Restricted permeability	1.00	Filtering capacity	1.00
1616:							
Boel, occasionally flooded	85	Very limited		Very limited		Very limited	
		Flooding	1.00	Depth to saturated zone	1.00	Filtering capacity	1.00
		Seepage	1.00	Flooding	0.60	Depth to saturated zone	0.95
		Depth to saturated zone	0.95			Flooding	0.60
1873:							
Burchard	50	Somewhat limited		Very limited		Very limited	
		Seepage	0.77	Restricted permeability	1.00	Too steep for surface application	1.00
		Too steep for surface application	0.50	Slope	1.00	Too steep for sprinkler application	0.50
						Restricted permeability	0.15
Steinauer	35	Somewhat limited		Very limited		Very limited	
		Seepage	0.77	Restricted permeability	1.00	Too steep for surface application	1.00
		Too steep for surface application	0.50	Slope	1.00	Too steep for sprinkler application	0.50
						Restricted permeability	0.15

Table 14b.--Agricultural Waste Management--Continued

Map symbol and soil name	Pct. of map unit	Overland flow of wastewater: Rating class and limiting features	Value	Rapid infiltration of wastewater: Rating class and limiting features	Value	Slow rate treatment of wastewater: Rating class and limiting features	Value
1879:							
Burchard------------	45	Very limited		Very limited		Very limited	
		Too steep for surface application	1.00	Slope	1.00	Too steep for surface application	1.00
		Seepage	0.77	Restricted permeability	1.00	Too steep for sprinkler application	1.00
						Restricted permeability	0.15
Steinauer-----------	40	Very limited		Very limited		Very limited	
		Too steep for surface application	1.00	Slope	1.00	Too steep for surface application	1.00
		Seepage	0.77	Restricted permeability	1.00	Too steep for sprinkler application	1.00
						Restricted permeability	0.15
2420:							
Deroin, severely eroded-------------	90	Somewhat limited		Very limited		Very limited	
		Seepage	0.69	Restricted permeability	1.00	Too steep for surface application	1.00
		Too acid	0.31	Slope	1.00	Too acid	0.31
		Too steep for surface application	0.22			Too steep for sprinkler application	0.22
						Restricted permeability	0.21
2830:							
Filbert-------------	90	Very limited		Very limited		Very limited	
		Seepage	1.00	Restricted permeability	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00			Restricted permeability	1.00
		Too level	1.00			Too acid	0.91
		Too acid	0.91				
2844:							
Fillmore------------	90	Very limited		Very limited		Very limited	
		Seepage	1.00	Ponding	1.00	Ponding	1.00
		Ponding	1.00	Restricted permeability	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00			Restricted permeability	1.00
		Too level	1.00			Too acid	0.42
		Too acid	0.42				
2863:							
Fluvaquents---------	95	Very limited		Very limited		Very limited	
		Flooding	1.00	Ponding	1.00	Ponding	1.00
		Ponding	1.00	Flooding	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Restricted permeability	1.00	Flooding	1.00
		Too level	1.00	Depth to saturated zone	1.00	Restricted permeability	0.94

Table 14b.--Agricultural Waste Management--Continued

Map symbol and soil name	Pct. of map unit	Overland flow of wastewater		Rapid infiltration of wastewater		Slow rate treatment of wastewater	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
3025:							
Gibbon, occasionally flooded-----------	95	Very limited		Very limited		Somewhat limited	
		Flooding	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.95
		Seepage	1.00	Restricted permeability	1.00	Flooding	0.60
		Depth to saturated zone	0.95	Flooding	0.60		
3038:							
Gibbon, occasionally flooded-----------	50	Very limited		Very limited		Somewhat limited	
		Flooding	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.95
		Seepage	1.00	Restricted permeability	1.00	Flooding	0.60
		Depth to saturated zone	0.95	Flooding	0.60		
Saltine, occasionally flooded-----------	38	Very limited		Very limited		Very limited	
		Flooding	1.00	Restricted permeability	1.00	Sodium content	1.00
		Sodium content	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.95
		Depth to saturated zone	0.95	Flooding	0.60	Flooding	0.60
		Seepage	0.77			Restricted permeability	0.15
						Salinity	0.01
3421:							
Hedville------------	80	Very limited		Very limited		Very limited	
		Seepage	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Depth to bedrock	1.00	Restricted permeability	1.00	Too steep for surface application	1.00
		Too steep for surface application	1.00	Slope	1.00	Too steep for sprinkler application	1.00
				Cobble content	0.02	Cobble content	0.12
3830:							
Ida-----------------	60	Very limited		Very limited		Very limited	
		Seepage	1.00	Slope	1.00	Too steep for surface application	1.00
		Too steep for surface application	1.00	Restricted permeability	1.00	Too steep for sprinkler application	1.00
Steinauer-----------	30	Very limited		Very limited		Very limited	
		Too steep for surface application	1.00	Slope	1.00	Too steep for surface application	1.00
		Seepage	0.77	Restricted permeability	1.00	Too steep for sprinkler application	1.00
						Restricted permeability	0.15

Table 14b.--Agricultural Waste Management--Continued

Map symbol and soil name	Pct. of map unit	Overland flow of wastewater		Rapid infiltration of wastewater		Slow rate treatment of wastewater	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
3890:							
Inglewood, rarely flooded-----------	85	Very limited		Very limited		Very limited	
		Seepage	1.00	Depth to saturated zone	1.00	Filtering capacity	1.00
		Flooding	0.40				
4104:							
Judson--------------	85	Very limited		Very limited		Not limited	
		Seepage	1.00	Restricted permeability	1.00		
4106:							
Judson--------------	90	Very limited		Very limited		Not limited	
		Seepage	1.00	Restricted permeability	1.00		
4250:							
Kenridge, occasionally flooded-----------	92	Very limited		Very limited		Somewhat limited	
		Flooding	1.00	Restricted permeability	1.00	Flooding	0.60
		Seepage	0.77	Depth to saturated zone	1.00	Restricted permeability	0.15
		Too acid	0.14	Flooding	0.60	Too acid	0.14
4404:							
Lamo, occasionally flooded-----------	96	Very limited		Very limited		Very limited	
		Flooding	1.00	Restricted permeability	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Flooding	0.60
		Seepage	0.77	Flooding	0.60	Restricted permeability	0.15
4583:							
Lex, occasionally flooded-----------	94	Very limited		Very limited		Very limited	
		Flooding	1.00	Depth to saturated zone	1.00	Filtering capacity	1.00
		Seepage	1.00	Restricted permeability	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Flooding	0.60	Flooding	0.60
4853:							
Malcolm-------------	85	Very limited		Very limited		Very limited	
		Seepage	1.00	Restricted permeability	1.00	Too steep for surface application	1.00
		Too steep for surface application	0.22	Slope	1.00	Too steep for sprinkler application	0.22
		Too acid	0.14			Too acid	0.14

Table 14b.--Agricultural Waste Management--Continued

Map symbol and soil name	Pct. of map unit	Overland flow of wastewater		Rapid infiltration of wastewater		Slow rate treatment of wastewater	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
4860:							
Malmo, severely eroded	85	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Restricted permeability	1.00	Restricted permeability	1.00
		Too steep for surface application	0.50	Slope	1.00	Too steep for surface application	1.00
		Too acid	0.14	Depth to saturated zone	0.01	Depth to saturated zone	1.00
						Too steep for sprinkler application	0.50
						Too acid	0.14
5388:							
Morrill	89	Very limited		Very limited		Very limited	
		Seepage	1.00	Restricted permeability	1.00	Too steep for surface application	1.00
		Too acid	1.00	Slope	1.00	Too acid	1.00
		Too steep for surface application	0.50			Too steep for sprinkler application	0.50
						Restricted permeability	0.26
						Filtering capacity	0.01
5480:							
Muscotah, occasionally flooded	90	Very limited		Very limited		Very limited	
		Flooding	1.00	Restricted permeability	1.00	Restricted permeability	1.00
		Depth to saturated zone	0.95	Depth to saturated zone	1.00	Depth to saturated zone	0.95
		Seepage	0.77	Flooding	0.60	Flooding	0.60
		Too level	0.08				
5540:							
Nodaway, occasionally flooded	90	Very limited		Very limited		Somewhat limited	
		Flooding	1.00	Depth to saturated zone	1.00	Flooding	0.60
		Seepage	1.00	Restricted permeability	1.00		
				Flooding	0.60		
5541:							
Nodaway, channeled	85	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Seepage	1.00	Depth to saturated zone	1.00		
				Restricted permeability	1.00		

Table 14b.--Agricultural Waste Management--Continued

Map symbol and soil name	Pct. of map unit	Overland flow of wastewater: Rating class and limiting features	Value	Rapid infiltration of wastewater: Rating class and limiting features	Value	Slow rate treatment of wastewater: Rating class and limiting features	Value
5736:							
Obert, frequently flooded-----------	80	Very limited		Very limited		Very limited	
		Flooding	1.00	Ponding	1.00	Ponding	1.00
		Ponding	1.00	Flooding	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Restricted permeability	1.00	Flooding	1.00
		Seepage	0.77	Depth to saturated zone	1.00	Restricted permeability	0.15
5742:							
Obert, occasionally flooded-----------	86	Very limited		Very limited		Very limited	
		Flooding	1.00	Restricted permeability	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Flooding	0.60
		Seepage	0.77	Flooding	0.60	Restricted permeability	0.15
5780:							
Olmitz--------------	85	Very limited		Very limited		Not limited	
		Seepage	1.00	Restricted permeability	1.00		
6046:							
Pawnee--------------	80	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Restricted permeability	1.00	Restricted permeability	1.00
		Seepage	0.62	Slope	1.00	Too steep for surface application	1.00
		Too steep for surface application	0.50	Depth to saturated zone	0.01	Depth to saturated zone	1.00
						Too steep for sprinkler application	0.50
6130:							
Platte, occasionally flooded-----------	80	Very limited		Very limited		Very limited	
		Flooding	1.00	Depth to saturated zone	1.00	Filtering capacity	1.00
		Seepage	1.00	Flooding	0.60	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Restricted permeability	0.32	Flooding	0.60
6138:							
Platte, frequently flooded-----------	50	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Filtering capacity	1.00
		Seepage	1.00	Depth to saturated zone	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Restricted permeability	0.32	Depth to saturated zone	1.00
Barney, frequently flooded, channeled-	46	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Depth to saturated zone	1.00
		Seepage	1.00	Depth to saturated zone	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Restricted permeability	1.00	Filtering capacity	1.00

Table 14b.--Agricultural Waste Management--Continued

Map symbol and soil name	Pct. of map unit	Overland flow of wastewater: Rating class and limiting features	Value	Rapid infiltration of wastewater: Rating class and limiting features	Value	Slow rate treatment of wastewater: Rating class and limiting features	Value
6160:							
Pohocco	80	Very limited		Very limited		Very limited	
		Seepage	1.00	Restricted permeability	1.00	Too steep for surface application	1.00
		Too steep for surface application	0.22	Slope	1.00	Too steep for sprinkler application	0.22
6162:							
Pohocco	80	Very limited		Very limited		Very limited	
		Seepage	1.00	Slope	1.00	Too steep for surface application	1.00
		Too steep for surface application	1.00	Restricted permeability	1.00	Too steep for sprinkler application	1.00
6170:							
Pohocco	52	Very limited		Very limited		Very limited	
		Seepage	1.00	Restricted permeability	1.00	Too steep for surface application	1.00
		Too steep for surface application	0.22	Slope	1.00	Too steep for sprinkler application	0.22
Pahuk	45	Very limited		Very limited		Very limited	
		Seepage	1.00	Slope	1.00	Too steep for surface application	1.00
		Too steep for surface application	0.22			Filtering capacity	1.00
						Too steep for sprinkler application	0.22
6172:							
Pohocco	59	Very limited		Very limited		Very limited	
		Seepage	1.00	Slope	1.00	Too steep for surface application	1.00
		Too steep for surface application	1.00	Restricted permeability	1.00	Too steep for sprinkler application	1.00
Pahuk	35	Very limited		Very limited		Very limited	
		Seepage	1.00	Slope	1.00	Too steep for surface application	1.00
		Too steep for surface application	1.00			Too steep for sprinkler application	1.00
						Filtering capacity	1.00

Table 14b.--Agricultural Waste Management--Continued

Map symbol and soil name	Pct. of map unit	Overland flow of wastewater: Rating class and limiting features	Value	Rapid infiltration of wastewater: Rating class and limiting features	Value	Slow rate treatment of wastewater: Rating class and limiting features	Value
6520:							
Saltillo, occasionally flooded-----------	85	Very limited		Very limited		Very limited	
		Flooding	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Seepage	1.00	Restricted permeability	1.00	Sodium content	1.00
		Depth to saturated zone	1.00	Flooding	0.60	Salinity	1.00
		Sodium content	1.00			Flooding	0.60
		Salinity	1.00				
6791:							
Scott--------------	100	Very limited		Very limited		Very limited	
		Seepage	1.00	Ponding	1.00	Ponding	1.00
		Ponding	1.00	Restricted permeability	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00			Restricted permeability	1.00
		Too level	1.00			Too acid	0.42
		Too acid	0.42				
7069:							
Steinauer----------	85	Very limited		Very limited		Very limited	
		Too steep for surface application	1.00	Slope	1.00	Too steep for surface application	1.00
		Seepage	0.77	Restricted permeability	1.00	Too steep for sprinkler application	1.00
						Restricted permeability	0.15
7290:							
Tomek--------------	86	Very limited		Very limited		Somewhat limited	
		Seepage	1.00	Restricted permeability	1.00	Restricted permeability	0.21
7920:							
Wann, occasionally flooded-----------	92	Very limited		Very limited		Somewhat limited	
		Flooding	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.84
		Seepage	1.00	Flooding	0.60	Flooding	0.60
		Depth to saturated zone	0.84	Restricted permeability	0.32	Sodium content	0.08
		Sodium content	0.08			Filtering capacity	0.01
8120:							
Yutan--------------	88	Very limited		Very limited		Very limited	
		Too steep for surface application	1.00	Slope	1.00	Too steep for surface application	1.00
		Seepage	0.77	Restricted permeability	1.00	Too steep for sprinkler application	1.00
		Too acid	0.42			Too acid	0.42
						Restricted permeability	0.15

Table 14b.--Agricultural Waste Management--Continued

Map symbol and soil name	Pct. of map unit	Overland flow of wastewater: Rating class and limiting features	Value	Rapid infiltration of wastewater: Rating class and limiting features	Value	Slow rate treatment of wastewater: Rating class and limiting features	Value
8124:							
Yutan	92	Somewhat limited		Very limited		Somewhat limited	
		Seepage	0.77	Restricted permeability	1.00	Too acid	0.42
		Too acid	0.42			Restricted permeability	0.15
						Too steep for surface application	0.08
8130:							
Yutan	65	Somewhat limited		Very limited		Somewhat limited	
		Seepage	0.77	Restricted permeability	1.00	Too acid	0.42
		Too acid	0.42			Restricted permeability	0.15
						Too steep for surface application	0.08
Aksarben	33	Very limited		Very limited		Somewhat limited	
		Seepage	1.00	Restricted permeability	1.00	Too acid	0.42
		Too acid	0.42			Restricted permeability	0.15
						Too steep for surface application	0.08
8134:							
Yutan	64	Somewhat limited		Very limited		Very limited	
		Seepage	0.77	Restricted permeability	1.00	Too steep for surface application	1.00
		Too acid	0.42	Slope	1.00	Too acid	0.42
		Too steep for surface application	0.22			Too steep for sprinkler application	0.22
						Restricted permeability	0.15
Judson	25	Very limited		Very limited		Very limited	
		Seepage	1.00	Restricted permeability	1.00	Too steep for surface application	1.00
		Too steep for surface application	0.22	Slope	1.00	Too steep for sprinkler application	0.22
9900:							
Arents, earthen dam	100	Not rated		Not rated		Not rated	
9985:							
Gravel pits	100	Not rated		Not rated		Not rated	
9998:							
Water	100	Not rated		Not rated		Not rated	

Table 15a.--Construction Materials

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The ratings given for the thickest layer are for the thickest layer above and excluding the bottom layer. The numbers in the value columns range from 0.00 to 0.99. The greater the value, the greater the likelihood that the bottom layer or thickest layer of the soil is a source of sand or gravel. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
1050:					
Aksarben	98	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
1100:					
Alda, occasionally flooded	85	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.09
		Thickest layer	0.00	Bottom layer	0.14
1347:					
Barney, frequently flooded	87	Poor		Good	
		Bottom layer	0.00	Bottom layer	0.93
		Thickest layer	0.00		
1616:					
Boel, occasionally flooded	85	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.18
		Thickest layer	0.00	Bottom layer	0.72
1873:					
Burchard	50	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Steinauer	35	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
1879:					
Burchard	45	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Steinauer	40	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
2420:					
Deroin, severely eroded	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
2830:					
Filbert	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00

Table 15a.--Construction Materials--Continued

Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
2844:					
Fillmore-----------	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
2863:					
Fluvaquents---------	95	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
3025:					
Gibbon, occasionally flooded-----------	95	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
3038:					
Gibbon, occasionally flooded-----------	50	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Saltine, occasionally flooded-----------	38	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.06
3421:					
Hedville-----------	80	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
3830:					
Ida----------------	60	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Steinauer----------	30	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
3890:					
Inglewood, rarely flooded-----------	85	Poor		Good	
		Bottom layer	0.00	Thickest layer	0.10
		Thickest layer	0.00		
4104:					
Judson-------------	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
4106:					
Judson-------------	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00

Table 15a.--Construction Materials--Continued

Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
4250:					
Kenridge, occasionally flooded-----------	92	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
4404:					
Lamo, occasionally flooded-----------	96	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
4583:					
Lex, occasionally flooded-----------	94	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.96
4853:					
Malcolm------------	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
4860:					
Malmo, severely eroded------------	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
5388:					
Morrill------------	89	Poor		Good	
		Bottom layer	0.00	Thickest layer	0.07
		Thickest layer	0.00		
5480:					
Muscotah, occasionally flooded-----------	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
5540:					
Nodaway, occasionally flooded-----------	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
5541:					
Nodaway, channeled--	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
5736:					
Obert, frequently flooded-----------	80	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00

Table 15a.--Construction Materials--Continued

Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
5742:					
Obert, occasionally flooded------------	86	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
5780:					
Olmitz--------------	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
6046:					
Pawnee--------------	80	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
6130:					
Platte, occasionally flooded------------	80	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.08
		Thickest layer	0.00	Bottom layer	0.16
6138:					
Platte, frequently flooded------------	50	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.08
		Thickest layer	0.00	Bottom layer	0.16
Barney, frequently flooded, channeled-	46	Poor		Good	
		Bottom layer	0.00	Bottom layer	0.93
		Thickest layer	0.00		
6160:					
Pohocco-------------	80	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
6162:					
Pohocco-------------	80	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
6170:					
Pohocco-------------	52	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Pahuk---------------	45	Poor		Good	
		Bottom layer	0.00		
		Thickest layer	0.00		
6172:					
Pohocco-------------	59	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Pahuk---------------	35	Poor		Good	
		Bottom layer	0.00		
		Thickest layer	0.00		

Table 15a.--Construction Materials--Continued

Map symbol and soil name	Pct. of map unit	Potential source of gravel: Rating class	Value	Potential source of sand: Rating class	Value
6520:					
Saltillo, occasionally flooded	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
6791:					
Scott	100	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
7069:					
Steinauer	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
7290:					
Tomek	86	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
7920:					
Wann, occasionally flooded	92	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.08
		Thickest layer	0.00	Bottom layer	0.10
8120:					
Yutan	88	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
8124:					
Yutan	92	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
8130:					
Yutan	65	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Aksarben	33	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
8134:					
Yutan	64	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Judson	25	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
9900:					
Arents, earthen dam	100	Not rated		Not rated	
9985:					
Gravel pits	100	Not rated		Not rated	
9998:					
Water	100	Not rated		Not rated	

Table 15b.--Construction Materials

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.00 to 0.99. The smaller the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
1050:							
Aksarben	98	Fair		Fair		Fair	
		Too clayey	0.08	Shrink-swell	0.87	Too clayey	0.07
		Too acid	0.84				
		Low content of organic matter	0.88				
		Water erosion	0.90				
1100:							
Alda, occasionally flooded	85	Fair		Fair		Fair	
		Low content of organic matter	0.12	Depth to saturated zone	0.76	Depth to saturated zone	0.76
1347:							
Barney, frequently flooded	87	Poor		Poor		Poor	
		Too sandy	0.00	Depth to saturated zone	0.00	Hard to reclaim	0.00
		Low content of organic matter	0.12			Too sandy	0.00
		Droughty	0.40			Depth to saturated zone	0.00
1616:							
Boel, occasionally flooded	85	Poor		Fair		Poor	
		Too sandy	0.00	Depth to saturated zone	0.76	Too sandy	0.00
		Wind erosion	0.00			Depth to saturated zone	0.76
		Low content of organic matter	0.12				
		Droughty	0.86				
1873:							
Burchard	50	Fair		Poor		Fair	
		Low content of organic matter	0.12	Low strength	0.00	Slope	0.96
		Water erosion	0.99	Shrink-swell	0.87		
Steinauer	35	Fair		Poor		Fair	
		Low content of organic matter	0.12	Low strength	0.00	Slope	0.96
		Water erosion	0.99	Shrink-swell	0.87		
1879:							
Burchard	45	Fair		Poor		Poor	
		Low content of organic matter	0.12	Low strength	0.00	Slope	0.00
		Water erosion	0.99	Shrink-swell	0.87		
Steinauer	40	Fair		Poor		Fair	
		Low content of organic matter	0.12	Low strength	0.00	Slope	0.04
		Water erosion	0.99	Shrink-swell	0.87		

Table 15b.--Construction Materials--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
2420:							
Deroin, severely eroded	90	Fair		Poor		Fair	
		Low content of organic matter	0.50	Low strength	0.00	Too clayey	0.44
		Too clayey	0.68	Shrink-swell	0.87		
		Too acid	0.88				
		Water erosion	0.90				
2830:							
Filbert	90	Poor		Poor		Poor	
		Too clayey	0.00	Depth to saturated zone	0.00	Too clayey	0.00
		Too acid	0.54	Shrink-swell	0.18	Depth to saturated zone	0.00
		Low content of organic matter	0.88				
		Water erosion	0.99				
2844:							
Fillmore	90	Poor		Poor		Poor	
		Too clayey	0.00	Depth to saturated zone	0.00	Too clayey	0.00
		Too acid	0.84	Low strength	0.00	Depth to saturated zone	0.00
		Water erosion	0.99	Shrink-swell	0.49		
2863:							
Fluvaquents	95	Poor		Poor		Poor	
		Low content of organic matter	0.00	Depth to saturated zone	0.00	Depth to saturated zone	0.00
		Too clayey	0.00			Too clayey	0.00
3025:							
Gibbon, occasionally flooded	95	Fair		Fair		Fair	
		Low content of organic matter	0.88	Depth to saturated zone	0.76	Depth to saturated zone	0.76
3038:							
Gibbon, occasionally flooded	50	Fair		Fair		Fair	
		Low content of organic matter	0.88	Depth to saturated zone	0.76	Depth to saturated zone	0.76
Saltine, occasionally flooded	38	Poor		Poor		Poor	
		Sodium content	0.00	Low strength	0.00	Sodium content	0.00
		Too alkaline	0.00	Shrink-swell	0.62	Salinity	0.00
		Low content of organic matter	0.12	Depth to saturated zone	0.76	Depth to saturated zone	0.76
		Salinity	0.88				
		Water erosion	0.90				
3421:							
Hedville	80	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Depth to bedrock	0.00
		Depth to bedrock	0.00	Slope	0.82	Slope	0.00
						Rock fragments	0.12

Table 15b.--Construction Materials--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
3830:							
Ida-----------------	60	Fair		Poor		Poor	
		Low content of organic matter	0.12	Slope	0.00	Slope	0.00
		Water erosion	0.90	Low strength	0.00	Carbonate content	0.97
		Carbonate content	0.97				
Steinauer-----------	30	Fair		Poor		Poor	
		Low content of organic matter	0.12	Low strength	0.00	Slope	0.00
		Water erosion	0.99	Slope	0.00		
				Shrink-swell	0.87		
3890:							
Inglewood, rarely flooded------------	85	Poor		Good		Good	
		Wind erosion	0.00				
		Low content of organic matter	0.12				
4104:							
Judson--------------	85	Fair		Poor		Good	
		Water erosion	0.90	Low strength	0.00		
				Shrink-swell	0.87		
4106:							
Judson--------------	90	Fair		Poor		Good	
		Water erosion	0.90	Low strength	0.00		
				Shrink-swell	0.87		
4250:							
Kenridge, occasionally flooded------------	92	Fair		Poor		Fair	
		Too clayey	0.92	Low strength	0.00	Too clayey	0.91
		Too acid	0.95	Shrink-swell	0.87		
4404:							
Lamo, occasionally flooded------------	96	Fair		Poor		Fair	
		Water erosion	0.90	Low strength	0.00	Depth to saturated zone	0.53
				Depth to saturated zone	0.53		
				Shrink-swell	0.87		
4583:							
Lex, occasionally flooded------------	94	Poor		Fair		Poor	
		Too sandy	0.00	Depth to saturated zone	0.53	Too sandy	0.00
		Low content of organic matter	0.12			Rock fragments	0.03
		Water erosion	0.99			Depth to saturated zone	0.53
						Hard to reclaim	0.98
4853:							
Malcolm-------------	85	Fair		Fair		Good	
		Low content of organic matter	0.12	Low strength	0.78		
		Water erosion	0.90				
		Too acid	0.95				

Table 15b.--Construction Materials--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
4860:							
Malmo, severely eroded	85	Poor		Poor		Poor	
		Too clayey	0.00	Low strength	0.00	Too clayey	0.00
		Low content of organic matter	0.18	Shrink-swell	0.34	Depth to saturated zone	0.53
		Too acid	0.95	Depth to saturated zone	0.53	Slope	0.96
		Water erosion	0.99				
5388:							
Morrill	89	Fair		Fair		Fair	
		Low content of organic matter	0.12	Shrink-swell	0.99	Rock fragments	0.88
		Too acid	0.32			Slope	0.96
5480:							
Muscotah, occasionally flooded	90	Poor		Poor		Poor	
		Too clayey	0.00	Low strength	0.00	Too clayey	0.00
		Water erosion	0.99	Shrink-swell	0.29	Depth to saturated zone	0.76
				Depth to saturated zone	0.76		
5540:							
Nodaway, occasionally flooded	90	Fair		Poor		Good	
		Low content of organic matter	0.12	Low strength	0.00		
		Water erosion	0.90	Shrink-swell	0.87		
5541:							
Nodaway, channeled	85	Fair		Poor		Good	
		Low content of organic matter	0.12	Low strength	0.00		
		Water erosion	0.90	Shrink-swell	0.87		
5736:							
Obert, frequently flooded	80	Fair		Poor		Poor	
		Low content of organic matter	0.88	Depth to saturated zone	0.00	Depth to saturated zone	0.00
		Water erosion	0.90	Low strength	0.00		
				Shrink-swell	0.69		
5742:							
Obert, occasionally flooded	86	Fair		Poor		Poor	
		Low content of organic matter	0.88	Depth to saturated zone	0.00	Depth to saturated zone	0.00
		Water erosion	0.90	Low strength	0.00		
				Shrink-swell	0.69		
5780:							
Olmitz	85	Good		Poor		Good	
				Low strength	0.00		
				Shrink-swell	0.87		

Table 15b.--Construction Materials--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
6046:							
Pawnee---------------	80	Poor		Poor		Poor	
		Too clayey	0.00	Low strength	0.00	Too clayey	0.00
		Low content of organic matter	0.12	Shrink-swell	0.17	Depth to saturated zone	0.53
		Water erosion	0.99	Depth to saturated zone	0.53	Slope	0.96
6130:							
Platte, occasionally flooded------------	80	Fair		Fair		Fair	
		Low content of organic matter	0.12	Depth to saturated zone	0.53	Rock fragments	0.03
		Too sandy	0.50			Too sandy	0.50
		Droughty	0.61			Depth to saturated zone	0.53
						Hard to reclaim	0.98
6138:							
Platte, frequently flooded------------	50	Fair		Fair		Fair	
		Low content of organic matter	0.12	Depth to saturated zone	0.53	Rock fragments	0.03
		Too sandy	0.50			Too sandy	0.50
		Droughty	0.61			Depth to saturated zone	0.53
						Hard to reclaim	0.98
Barney, frequently flooded, channeled-	46	Poor		Poor		Poor	
		Too sandy	0.00	Depth to saturated zone	0.00	Hard to reclaim	0.00
		Low content of organic matter	0.12			Too sandy	0.00
		Droughty	0.40			Depth to saturated zone	0.00
6160:							
Pohocco--------------	80	Fair		Poor		Good	
		Low content of organic matter	0.12	Low strength	0.00		
		Water erosion	0.90	Shrink-swell	0.87		
6162:							
Pohocco--------------	80	Fair		Poor		Fair	
		Low content of organic matter	0.12	Low strength	0.00	Slope	0.04
		Water erosion	0.90	Shrink-swell	0.87		
6170:							
Pohocco--------------	52	Fair		Poor		Good	
		Low content of organic matter	0.12	Low strength	0.00		
		Water erosion	0.90	Shrink-swell	0.87		
Pahuk----------------	45	Poor		Good		Poor	
		Too sandy	0.00			Too sandy	0.00
		Wind erosion	0.00				
		Low content of organic matter	0.12				
		Droughty	0.90				
6172:							
Pohocco--------------	59	Fair		Poor		Fair	
		Low content of organic matter	0.12	Low strength	0.00	Slope	0.04
		Water erosion	0.90	Shrink-swell	0.87		

Table 15b.--Construction Materials--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
6172:							
Pahuk	35	Poor		Good		Poor	
		Too sandy	0.00			Too sandy	0.00
		Wind erosion	0.00			Slope	0.04
		Low content of organic matter	0.12				
		Droughty	0.90				
6520:							
Saltillo, occasionally flooded	85	Poor		Poor		Poor	
		Sodium content	0.00	Depth to saturated zone	0.00	Depth to saturated zone	0.00
		Salinity	0.00	Shrink-swell	0.87	Sodium content	0.00
		Low content of organic matter	0.12			Salinity	0.00
		Water erosion	0.90				
6791:							
Scott	100	Fair		Poor		Poor	
		Too acid	0.84	Depth to saturated zone	0.00	Depth to saturated zone	0.00
		Water erosion	0.99	Shrink-swell	0.35		
7069:							
Steinauer	85	Fair		Poor		Poor	
		Low content of organic matter	0.12	Low strength	0.00	Slope	0.00
		Water erosion	0.99	Slope	0.50		
				Shrink-swell	0.87		
7290:							
Tomek	86	Fair		Fair		Fair	
		Too clayey	0.18	Shrink-swell	0.31	Too clayey	0.17
		Water erosion	0.90				
7920:							
Wann, occasionally flooded	92	Fair		Fair		Fair	
		Low content of organic matter	0.88	Depth to saturated zone	0.91	Depth to saturated zone	0.91
		Sodium content	0.97			Rock fragments	0.97
						Sodium content	0.98
8120:							
Yutan	88	Fair		Poor		Fair	
		Low content of organic matter	0.12	Low strength	0.00	Slope	0.04
		Too acid	0.84	Shrink-swell	0.87		
		Water erosion	0.90				
8124:							
Yutan	92	Fair		Poor		Good	
		Low content of organic matter	0.12	Low strength	0.00		
		Too acid	0.84	Shrink-swell	0.87		
		Water erosion	0.90				

Table 15b.--Construction Materials--Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
8130:							
Yutan---------------	65	Fair		Poor		Good	
		Low content of organic matter	0.12	Low strength	0.00		
		Too acid	0.84	Shrink-swell	0.87		
		Water erosion	0.90				
Aksarben------------	33	Fair		Fair		Fair	
		Too clayey	0.08	Shrink-swell	0.87	Too clayey	0.07
		Too acid	0.84				
		Low content of organic matter	0.88				
		Water erosion	0.90				
8134:							
Yutan---------------	64	Fair		Poor		Good	
		Low content of organic matter	0.12	Low strength	0.00		
		Too acid	0.84	Shrink-swell	0.87		
		Water erosion	0.90				
Judson--------------	25	Fair		Poor		Good	
		Water erosion	0.90	Low strength	0.00		
				Shrink-swell	0.87		
9900:							
Arents, earthen dam-	100	Not rated		Not rated		Not rated	
9985:							
Gravel pits---------	100	Not rated		Not rated		Poor	
						Hard to reclaim	0.00
						Too sandy	0.00
						Slope	0.00
						Rock fragments	0.00
						Hard to reclaim	0.92
9998:							
Water---------------	100	Not rated		Not rated		Not rated	

Table 16.--Water Management

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1050:							
Aksarben------------	98	Somewhat limited Seepage	 0.70	Not limited		Very limited Depth to water	 1.00
1100:							
Alda, occasionally flooded-----------	85	Very limited Seepage	 1.00	Somewhat limited Depth to saturated zone Seepage	 0.95 0.14	Very limited Cutbanks cave Depth to water	 1.00 0.02
1347:							
Barney, frequently flooded-----------	87	Very limited Seepage	 1.00	Very limited Depth to saturated zone Seepage	 1.00 1.00	Very limited Cutbanks cave	 1.00
1616:							
Boel, occasionally flooded-----------	85	Very limited Seepage	 1.00	Somewhat limited Depth to saturated zone Seepage	 0.95 0.72	Very limited Cutbanks cave Depth to water	 1.00 0.02
1873:							
Burchard------------	50	Somewhat limited Seepage	 0.05	Somewhat limited Piping	 0.26	Very limited Depth to water	 1.00
Steinauer-----------	35	Somewhat limited Seepage	 0.05	Somewhat limited Piping	 0.08	Very limited Depth to water	 1.00
1879:							
Burchard------------	45	Somewhat limited Seepage Slope	 0.05 0.03	Somewhat limited Piping	 0.17	Very limited Depth to water	 1.00
Steinauer-----------	40	Somewhat limited Seepage Slope	 0.05 0.02	Somewhat limited Piping	 0.08	Very limited Depth to water	 1.00
2420:							
Deroin, severely eroded------------	90	Somewhat limited Seepage	 0.04	Somewhat limited Piping	 0.01	Very limited Depth to water	 1.00
2830:							
Filbert-------------	90	Not limited		Very limited Depth to saturated zone Hard to pack	 1.00 0.76	Very limited Depth to water	 1.00

Table 16.--Water Management--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
2844:							
Fillmore------------	90	Somewhat limited		Very limited		Very limited	
		Seepage	0.70	Ponding	1.00	Depth to water	1.00
				Depth to saturated zone	1.00		
				Hard to pack	0.74		
2863:							
Fluvaquents---------	95	Very limited		Very limited		Somewhat limited	
		Seepage	1.00	Ponding	1.00	Cutbanks cave	0.10
				Depth to saturated zone	1.00		
3025:							
Gibbon, occasionally flooded------------	95	Somewhat limited		Somewhat limited		Somewhat limited	
		Seepage	0.70	Depth to saturated zone	0.95	Slow refill	0.30
						Cutbanks cave	0.10
				Piping	0.68	Depth to water	0.02
3038:							
Gibbon, occasionally flooded------------	50	Somewhat limited		Somewhat limited		Somewhat limited	
		Seepage	0.70	Depth to saturated zone	0.95	Slow refill	0.30
						Cutbanks cave	0.10
				Piping	0.68	Depth to water	0.02
Saltine, occasionally flooded------------	38	Somewhat limited		Very limited		Somewhat limited	
		Seepage	0.70	Piping	1.00	Salty water	0.50
				Depth to saturated zone	0.95	Slow refill	0.30
						Cutbanks cave	0.10
				Salinity	0.12	Depth to water	0.02
				Seepage	0.06		
3421:							
Hedville------------	80	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Thin layer	1.00	Depth to water	1.00
		Slope	0.08				
3830:							
Ida-----------------	60	Somewhat limited		Very limited		Very limited	
		Slope	0.85	Piping	1.00	Depth to water	1.00
		Seepage	0.70				
Steinauer-----------	30	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.85	Piping	0.08	Depth to water	1.00
		Seepage	0.05				
3890:							
Inglewood, rarely flooded------------	85	Very limited		Very limited		Very limited	
		Seepage	1.00	Seepage	1.00	Cutbanks cave	1.00
						Depth to water	0.96
4104:							
Judson--------------	85	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Piping	0.02	Depth to water	1.00

Table 16.--Water Management--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
4106:							
Judson	90	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Piping	0.02	Depth to water	1.00
4250:							
Kenridge, occasionally flooded	92	Somewhat limited		Somewhat limited		Somewhat limited	
		Seepage	0.05	Piping	0.01	Depth to water	0.96
						Slow refill	0.95
						Cutbanks cave	0.10
4404:							
Lamo, occasionally flooded	96	Somewhat limited		Very limited		Somewhat limited	
		Seepage	0.05	Depth to saturated zone	1.00	Slow refill	0.95
						Cutbanks cave	0.10
				Piping	0.08	Depth to water	0.01
4583:							
Lex, occasionally flooded	94	Very limited		Very limited		Very limited	
		Seepage	1.00	Depth to saturated zone	1.00	Cutbanks cave	1.00
						Depth to water	0.01
				Seepage	0.96		
4853:							
Malcolm	85	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Piping	0.69	Depth to water	1.00
4860:							
Malmo, severely eroded	85	Not limited		Very limited		Very limited	
				Depth to saturated zone	1.00	Depth to water	1.00
				Hard to pack	0.47		
5388:							
Morrill	89	Very limited		Very limited		Very limited	
		Seepage	1.00	Seepage	1.00	Depth to water	1.00
5480:							
Muscotah, occasionally flooded	90	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.05	Depth to saturated zone	0.95	Slow refill	1.00
						Cutbanks cave	0.10
				Hard to pack	0.76	Depth to water	0.02
5540:							
Nodaway, occasionally flooded	90	Somewhat limited		Somewhat limited		Somewhat limited	
		Seepage	0.70	Piping	0.68	Depth to water	0.81
						Slow refill	0.30
						Cutbanks cave	0.10
5541:							
Nodaway, channeled	85	Somewhat limited		Somewhat limited		Somewhat limited	
		Seepage	0.70	Piping	0.68	Depth to water	0.81
						Slow refill	0.30
						Cutbanks cave	0.10

Table 16.--Water Management--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
5736:							
Obert, frequently flooded-----------	80	Somewhat limited		Very limited		Somewhat limited	
		Seepage	0.57	Ponding	1.00	Slow refill	0.43
				Depth to saturated zone	1.00	Cutbanks cave	0.10
				Piping	0.05		
5742:							
Obert, occasionally flooded-----------	86	Somewhat limited		Very limited		Somewhat limited	
		Seepage	0.57	Depth to saturated zone	1.00	Slow refill	0.43
				Piping	0.05	Cutbanks cave	0.10
5780:							
Olmitz-------------	85	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Piping	0.08	Depth to water	1.00
6046:							
Pawnee-------------	80	Not limited		Very limited		Very limited	
				Depth to saturated zone	1.00	Depth to water	1.00
				Hard to pack	0.68		
6130:							
Platte, occasionally flooded-----------	80	Very limited		Very limited		Very limited	
		Seepage	1.00	Depth to saturated zone	1.00	Cutbanks cave	1.00
				Seepage	0.16	Depth to water	0.01
6138:							
Platte, frequently flooded-----------	50	Very limited		Very limited		Very limited	
		Seepage	1.00	Depth to saturated zone	1.00	Cutbanks cave	1.00
				Seepage	0.16	Depth to water	0.01
Barney, frequently flooded, channeled-	46	Very limited		Very limited		Very limited	
		Seepage	1.00	Depth to saturated zone	1.00	Cutbanks cave	1.00
				Seepage	1.00		
6160:							
Pohocco------------	80	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Piping	0.58	Depth to water	1.00
6162:							
Pohocco------------	80	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Piping	0.58	Depth to water	1.00
		Slope	0.02				
6170:							
Pohocco------------	52	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Piping	0.58	Depth to water	1.00
Pahuk--------------	45	Very limited		Very limited		Very limited	
		Seepage	1.00	Seepage	1.00	Depth to water	1.00

Table 16.--Water Management--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas: Rating class and limiting features	Value	Embankments, dikes, and levees: Rating class and limiting features	Value	Aquifer-fed excavated ponds: Rating class and limiting features	Value
6172:							
Pohocco	59	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Piping	0.58	Depth to water	1.00
		Slope	0.02				
Pahuk	35	Very limited		Very limited		Very limited	
		Seepage	1.00	Seepage	1.00	Depth to water	1.00
		Slope	0.02				
6520:							
Saltillo, occasionally flooded	85	Somewhat limited		Very limited		Somewhat limited	
		Seepage	0.70	Depth to saturated zone	1.00	Salty water	0.99
				Piping	1.00	Slow refill	0.30
				Salinity	1.00	Cutbanks cave	0.10
6791:							
Scott	100	Not limited		Very limited		Very limited	
				Ponding	1.00	Depth to water	1.00
				Depth to saturated zone	1.00		
				Hard to pack	0.75		
7069:							
Steinauer	85	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.12	Piping	0.08	Depth to water	1.00
		Seepage	0.05				
7290:							
Tomek	86	Somewhat limited		Not limited		Very limited	
		Seepage	0.05			Depth to water	1.00
7920:							
Wann, occasionally flooded	92	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Depth to saturated zone	0.84	Cutbanks cave	1.00
				Seepage	0.10	Depth to water	0.07
				Piping	0.02		
8120:							
Yutan	88	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Piping	0.13	Depth to water	1.00
		Slope	0.02				
8124:							
Yutan	92	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Piping	0.13	Depth to water	1.00
8130:							
Yutan	65	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Piping	0.13	Depth to water	1.00
Aksarben	33	Somewhat limited		Not limited		Very limited	
		Seepage	0.70			Depth to water	1.00

Table 16.--Water Management--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
8134:							
Yutan----------------	64	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Piping	0.13	Depth to water	1.00
Judson---------------	25	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.70	Piping	0.02	Depth to water	1.00
9900:							
Arents, earthen dam-	100	Not rated		Not rated		Not rated	
9985:							
Gravel pits----------	100	Very limited		Not rated		Not rated	
		Seepage	1.00				
		Slope	0.03				
9998:							
Water----------------	100	Not rated		Not rated		Not rated	

Table 17.--Engineering Index Properties

(Absence of an entry indicates that the data were not estimated.)

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number: 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct	Pct					Pct	
1050:												
Aksarben--------	0-6	Silty clay loam	CL	A-6	0	0	100	100	95-100	90-100	36-44	16-22
	6-12	Silty clay loam	CL	A-6	0	0	100	100	95-100	90-100	36-44	16-22
	12-18	Silty clay loam, silty clay	CH, CL	A-7-6	0	0	100	100	95-100	90-100	51-58	29-35
	18-26	Silty clay loam, silty clay	CH, CL	A-7-6	0	0	100	100	95-100	90-100	51-58	29-35
	26-34	Silty clay loam, silty clay	CH, CL	A-7	0	0	100	100	95-100	90-100	51-58	29-35
	34-42	Silty clay loam, silty clay	CH, CL	A-7-6	0	0	100	100	95-100	90-100	51-58	29-35
	42-60	Silty clay loam	CL	A-7-6	0	0	100	100	95-100	90-100	43-51	23-29
	60-80	Silty clay loam, silt loam	CL	A-6	0	0	100	100	95-100	85-95	36-51	17-29
1100:												
Alda, occasionally flooded--------	0-11	Fine sandy loam	CL, CL-ML, ML	A-4	0	0	90-100	85-100	85-100	50-75	15-23	NP-6
	11-17	Fine sandy loam, sandy loam, very fine sandy loam	SC-SM, SM	A-4	0	0	95-100	95-100	70-100	30-50	15-23	NP-6
	17-29	Fine sandy loam, sandy loam, very fine sandy loam	SC-SM, SM	A-4	0	0	95-100	95-100	70-100	30-50	15-23	NP-6
	29-34	Coarse sand, gravelly sand	SC-SM, SM, SP, SP-SM	A-2-4	0	0	70-100	65-95	30-95	2-15	12-18	NP-5
	34-80	Stratified coarse sand to gravelly sand, stratified gravelly sand	SC-SM, SM, SP, SP-SM	A-2-4	0	0	70-100	65-95	30-95	2-15	12-18	NP-5
1347:												
Barney, frequently flooded--------	0-7	Silty clay loam	CL	A-6	0	0	100	100	95-100	85-95	36-44	16-22
	7-10	Loam	CL	A-4	0	0	95-100	90-100	85-95	60-95	21-36	4-16
	10-30	Fine sand, sand, loamy sand	SP-SC	A-1-b	0	0	90-100	90-100	30-70	3-15	0-10	NP-5
	30-80	Coarse sand, sand, fine sand	SP-SC	A-1-b	0	0	90-100	75-95	30-70	3-15	0-10	NP-5

Table 17.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
1616:												
Boel, occasionally flooded--------	0-11	Loamy fine sand	SC	A-2-4	0	0	100	95-100	85-95	0-35	5-21	NP-4
	11-15	Fine sandy loam, loamy fine sand	SC	A-2-4	0	0	100	95-100	85-95	0-25	5-30	NP-11
	15-60	Stratified fine sand, stratified loamy fine sand, stratified coarse sand	SC	A-2-4	0	0	100	95-100	85-95	0-25	2-20	NP-3
1873:												
Burchard--------	0-13	Clay loam	CL	A-6	0	0-5	95-100	95-100	85-95	60-80	36-39	15-18
	13-19	Clay loam	CL	A-7-6	0	0-5	95-100	85-100	75-95	60-80	36-44	15-22
	19-29	Clay loam	CL	A-7-6	0	0-5	95-100	85-100	75-95	60-80	34-38	14-18
	29-37	Clay loam	CL	A-7-6	0	0-5	95-100	85-100	75-95	60-80	34-39	14-18
	37-60	Clay loam	CL	A-6	0	0-5	95-100	85-100	75-95	60-80	34-39	14-18
Steinauer-------	0-6	Clay loam	CL	A-6	0	0-5	95-100	95-100	85-100	55-90	36-41	16-20
	6-15	Clay loam	CL	A-6	0	0-5	95-100	95-100	85-100	70-90	36-41	16-20
	15-41	Loam, clay loam	CL	A-6	0	0-5	95-100	95-100	85-100	60-75	34-44	14-22
	41-60	Loam, clay loam	CL	A-6	0	0-5	95-100	95-100	85-100	60-75	34-44	14-22
1879:												
Burchard--------	0-13	Clay loam	CL	A-6	0	0-5	95-100	95-100	85-95	60-80	36-39	15-18
	13-19	Clay loam	CL	A-7-6	0	0-5	95-100	85-100	75-95	60-80	36-44	15-22
	19-29	Clay loam	CL	A-7-6	0	0-5	95-100	85-100	75-95	60-80	34-39	9-22
	29-37	Clay loam	CL	A-7-6	0	0-5	95-100	85-100	75-95	60-80	24-39	14-18
	37-60	Clay loam	CL	A-6	0	0-5	95-100	85-100	75-95	60-80	34-39	14-18
Steinauer-------	0-6	Clay loam	CL	A-6	0	0-5	95-100	95-100	85-100	55-90	36-41	16-20
	6-15	Clay loam	CL	A-6	0	0-5	95-100	95-100	85-100	70-90	36-41	16-20
	15-41	Loam, clay loam	CL	A-6	0	0-5	95-100	95-100	85-100	60-75	34-44	14-22
	41-60	Loam, clay loam	CL	A-6	0	0-5	95-100	95-100	85-100	60-75	34-44	14-22
2420:												
Deroin, severely eroded---------	0-7	Silty clay loam	CL	A-7-6	0	0	100	100	90-100	85-95	36-48	16-25
	7-12	Silty clay loam, clay loam	CL	A-7-6	0	0	100	100	90-100	70-95	36-44	16-22
	12-18	Silty clay loam, clay loam	CL	A-7-6	0	0	100	100	90-100	70-95	36-44	16-22
	18-40	Silty clay loam, clay loam	CL	A-7-6	0	0	100	100	90-100	70-95	36-44	16-22
	40-50	Loam, clay loam, silty clay loam	CL	A-6	0	0	100	100	90-100	70-95	34-41	14-20
	50-80	Loam, clay loam, silty clay loam	CL	A-6	0	0	100	100	90-100	70-95	34-41	14-20

Table 17.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
2830:												
Filbert---------	0-5	Silt loam	CL	A-6	0	0	100	100	100	95-100	28-36	9-16
	5-7	Silt loam	CL	A-6	0	0	100	100	100	95-100	28-36	9-16
	7-12	Silt loam	CL	A-4	0	0	100	100	100	95-100	25-30	7-11
	12-15	Silt loam	CL	A-4	0	0	100	100	100	95-100	25-30	7-11
	15-25	Silty clay, clay	CH	A-7-6	0	0	100	100	100	95-100	61-71	37-45
	25-36	Silty clay, clay	CH	A-7-6	0	0	100	100	100	95-100	61-71	37-45
	36-43	Silty clay, clay	CH	A-7-6	0	0	100	100	100	95-100	61-71	37-45
	43-53	Silty clay, clay	CH	A-7-6	0	0	100	100	100	95-100	61-71	37-45
	53-62	Silty clay, clay	CH	A-7-6	0	0	100	100	100	95-100	61-71	37-45
	62-80	Silty clay, silty clay loam	CH	A-7-6	0	0	100	100	100	95-100	51-61	29-37
2844:												
Fillmore--------	0-7	Silt loam	CL	A-6	0	0	100	100	95-100	95-100	28-36	9-16
	7-14	Silt loam	CL	A-6	0	0	100	100	95-100	95-100	28-36	9-16
	14-22	Silt loam	CL	A-4	0	0	100	100	95-100	95-100	25-30	7-11
	22-30	Clay, silty clay	CH	A-7-6	0	0	100	100	100	95-100	61-71	37-45
	30-42	Clay, silty clay	CH	A-7-6	0	0	100	100	100	95-100	61-71	37-45
	42-54	Clay, silty clay	CH	A-7-6	0	0	100	100	100	95-100	61-71	37-45
	54-62	Clay, silty clay	CH	A-7-6	0	0	100	100	100	95-100	61-71	37-45
	62-80	Clay, silty clay	CH	A-7-6	0	0	100	100	100	95-100	61-71	37-45
2863:												
Fluvaquents-----	0-20	Silty clay	CL	A-7-6	0	0	100	100	85-100	45-95	35-66	15-40
	20-80	Stratified variable	GP	A-1-a	0	0	---	---	---	---	---	---
3025:												
Gibbon, occasionally flooded--------	0-5	Silt loam	CL	A-6	0	0	100	100	85-100	70-90	30-36	11-16
	5-19	Silt loam	CL	A-6	0	0	100	100	85-100	70-90	30-36	11-16
	19-24	Silt loam	CL	A-6	0	0	100	100	85-100	70-90	30-36	11-16
	24-30	Silt loam, loam	CL	A-6	0	0	100	100	90-100	80-90	30-36	11-16
	30-42	Stratified loam to silt loam	CL	A-6	0	0	100	100	70-95	35-90	15-36	11-16
	42-60	Stratified loam to silt loam	CL	A-6	0	0	100	100	70-95	35-90	15-36	11-16

Table 17.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
3038: Gibbon, occasionally flooded--------	0-5	Silt loam	CL	A-6	0	0	100	100	85-100	70-90	30-36	11-16
	5-19	Silt loam	CL	A-6	0	0	100	100	85-100	70-90	30-36	11-16
	19-24	Silt loam	CL	A-6	0	0	100	100	85-100	70-90	30-36	11-16
	24-30	Silt loam, loam	CL	A-6	0	0	100	100	90-100	80-90	30-36	11-16
	30-42	Stratified loam to silt loam	CL	A-6	0	0	100	100	70-95	35-90	15-36	11-16
	42-60	Stratified loam to silt loam	CL	A-6	0	0	100	100	70-95	35-90	15-36	11-16
3038: Saltine, occasionally flooded--------	0-7	Silty clay loam	CL	A-7-6	0	0	100	100	95-100	70-95	36-44	16-22
	7-12	Silt loam, silty clay loam, loam	CL	A-6	0	0	95-100	95-100	85-100	60-100	28-48	9-25
	12-30	Silt loam, silty clay loam, loam	CL	A-6	0	0	95-100	95-100	85-100	60-100	28-48	9-25
	30-48	Silty clay loam, silt loam, silty clay	CL	A-7-6	0	0	95-100	95-100	95-100	70-95	30-54	11-30
	48-55	Silty clay loam, silt loam, sandy clay loam	CL	A-6	0	0	100	100	20-95	20-90	30-48	11-25
	55-60	Silty clay loam, silt loam, sandy clay loam	CL	A-6	0	0	100	100	20-95	20-90	30-48	11-25
3421: Hedville--------	0-10	Cobbly loam	SC	A-4	0	15-25	80-100	75-100	40-100	10-70	20-30	3-11
	10-16	Cobbly loam, sandy loam, loamy sand	ML	A-4	0	2-15	80-100	75-100	30-90	15-90	18-30	2-11
	16-22	Bedrock			---	---	---	---	---	---	---	---
3830: Ida-------------	0-4	Silt loam	CL	A-6	0	0	100	100	95-100	95-100	28-35	9-15
	4-8	Silt loam	CL	A-4	0	0	100	100	95-100	95-100	28-35	9-15
	8-18	Silt loam	ML	A-4	0	0	100	100	95-100	95-100	30-40	5-15
	18-40	Silt loam	ML	A-4	0	0	100	100	95-100	95-100	30-40	5-15
	40-60	Silt loam	ML	A-4	0	0	100	100	95-100	95-100	30-40	5-15
Steinauer-------	0-6	Clay loam	CL	A-6	0	0-5	95-100	95-100	85-100	55-90	36-41	16-20
	6-15	Clay loam	CL	A-6	0	0-5	95-100	95-100	85-100	70-90	36-41	16-20
	15-41	Loam, clay loam	CL	A-6	0	0-5	95-100	95-100	85-100	60-75	34-44	14-22
	41-60	Loam, clay loam	CL	A-6	0	0-5	95-100	95-100	85-100	60-75	34-44	14-22

Table 17.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct	Pct					Pct	
3890:												
Inglewood, rarely flooded-	0-5	Loamy fine sand	SC	A-2-4	0	0	100	100	50-80	15-35	15-20	NP-6
	5-22	Stratified sand to fine sandy loam	SC	A-2-4	0	0	100	100	50-85	5-55	15-20	NP-4
	22-30	Stratified sand to fine sandy loam	SC	A-2-4	0	0	100	100	50-85	5-55	15-20	NP 4
	30-40	Stratified sand to fine sandy loam	SC	A-2-4	0	0	100	100	50-85	5-55	15-20	NP-4
	40-50	Sand, fine sand, loamy fine sand	SC	A-2-4, A-3	0	0	100	100	50-80	5-35	15-20	NP-3
	50-80	Sand, fine sand, loamy fine sand	SC	A-2-4, A-3	0	0	100	100	50-80	5-35	15-20	NP-3
4104:												
Judson----------	0-6	Silt loam	CL	A-6	0	0	100	100	100	95-100	34-36	14-16
	6-12	Silty clay loam	CL	A-6	0	0	100	100	100	95-100	36-41	16-20
	12-22	Silty clay loam	CL	A-6	0	0	100	100	100	95-100	36-41	16-20
	22-31	Silty clay loam	CL	A-6	0	0	100	100	100	95-100	36-41	16-20
	31-43	Silty clay loam	CL	A-7-6	0	0	100	100	100	95-100	36-44	16-22
	43-54	Silty clay loam	CL	A-7-6	0	0	100	100	100	95-100	36-44	16-22
	54-69	Silty clay loam	CL	A-7-6	0	0	100	100	100	95-100	36-44	16-22
	69-80	Silty clay loam	CL	A-7 6	0	0	100	100	100	95-100	36-44	16-22
4106:												
Judson----------	0-6	Silt loam	CL	A-6	0	0	100	100	100	95-100	34-36	14-16
	6-12	Silty clay loam	CL	A-6	0	0	100	100	100	95-100	36-41	16-20
	12-22	Silty clay loam	CL	A-6	0	0	100	100	100	95-100	36-41	16-20
	22-31	Silty clay loam	CL	A-6	0	0	100	100	100	95-100	36-41	16-20
	31-43	Silty clay loam	CL	A-7-6	0	0	100	100	100	95-100	36-44	16-22
	43-54	Silty clay loam	CL	A-7-6	0	0	100	100	100	95-100	36-44	16-22
	54-69	Silty clay loam	CL	A-7-6	0	0	100	100	100	95-100	36-44	16-22
	69-80	Silty clay loam	CL	A-7-6	0	0	100	100	100	95-100	36-44	16-22
4250:												
Kenridge, occasionally flooded--------	0-8	Silty clay loam	CL	A-6	0	0	100	100	95-100	85-95	36-41	16-20
	8-20	Silty clay loam	CL	A-6	0	0	100	100	95-100	85-95	36-41	16-20
	20-36	Silty clay loam	CL	A-7-6	0	0	100	100	95-100	85-95	36-44	16-22
	36-46	Silty clay loam	CL	A-7-6	0	0	100	100	95-100	85-95	36-44	16-22
	46-60	Silty clay loam	CL	A-7-6	0	0	100	100	95-100	85-95	36-44	16-22
	60-80	Silty clay loam	CL	A-7-6	0	0	100	100	90-100	70-80	36-44	16-22

Table 17.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification Unified	Classification AASHTO	Fragments >10 inches	Fragments 3-10 inches	Percentage passing sieve number-- 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
4404:												
Lamo, occasionally flooded--------	0-5	Silty clay loam	CL	A-6	0	0	100	100	95-100	80-95	34-44	14-22
	5-25	Silty clay loam	CL	A-6	0	0	100	100	95-100	80-95	34-44	14-22
	25-36	Silty clay loam	CL	A-6	0	0	100	100	95-100	80-95	34-44	14-22
	36-44	Silty clay loam, silt loam	CL	A-6, A-7	0	0	100	100	95-100	85-95	34-44	14-22
	44-60	Silty clay loam, silt loam	CL	A-6	0	0	100	100	95-100	85-95	34-44	14-22
4583:												
Lex, occasionally flooded--------	0-7	Loam, clay loam	CL	A-6	0	0	95-100	95-100	85-100	60-95	26-44	8-22
	7-17	Loam, clay loam	CL	A-6	0	0	95-100	95-100	85-100	60-95	26-44	8-22
	17-19	Loam, clay loam	CL	A-6	0	0	95-100	95-100	85-100	60-95	26-44	8-22
	19-27	Stratified fine sandy loam to loam to sandy clay loam	CL	A-6	0	0	95-100	95-100	85-100	60-90	28-41	9-20
	27-60	Gravelly sand, coarse sand	SP-SC	A-1-b	0	0	60-100	50-95	30-65	3-14	1-16	NP-2
4853:												
Malcolm---------	0-7	Silt loam	CL	A-6	0	0	100	100	90-100	70-90	28-36	9-16
	7-12	Silty clay loam, silt loam	CL	A-7-6	0	0	100	100	90-100	70-95	34-44	14-22
	12-20	Silty clay loam, silt loam	CL	A-7-6	0	0	100	100	90-100	70-95	34-44	14-22
	20-28	Silty clay loam, silt loam	CL	A-6	0	0	100	100	90-100	70-95	34-44	14-22
	28-60	Silt loam, very fine sandy loam	CL, CL-ML, ML	A-6	0	0	100	100	85-100	50-90	19-36	3-16
4860:												
Malmo, severely eroded---------	0-6	Clay loam	CL	A-7-6	0	0	95-100	95-100	85-100	70-90	44-48	22-25
	6-15	Clay, sandy clay, clay loam	CH	A-7-6	0	0	100	95-100	85-100	80-95	51-66	29-41
	15-25	Clay, sandy clay, clay loam	CH	A-7-6	0	0	100	95-100	85-100	80-95	51-66	29-41
	25-39	Clay, sandy clay, clay loam	CH	A-7-6	0	0	100	95-100	85-100	80-95	51-66	29-41
	39-43	Clay, gravelly clay, sandy clay	CH	A-7-6	0	0	95-100	75-85	65-75	60-70	51-66	29-41
	43-54	Loam, clay loam	CL	A-7-6	0	0	95-100	95-100	85-100	70-90	34-63	15-39
	54-80	Loam, clay loam	CL	A-6	0	0	95-100	90-100	65-95	60-95	34-63	15-39

Table 17.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
538B:												
Morrill---------	0-6	Loam	CL	A-6	0	0	95-100	75-100	65-100	50-80	25-36	8-16
	6-12	Loam, clay loam	CL	A-6	0	0	95-100	75-100	65-100	50-80	28-44	9-22
	12-22	Loam, sandy clay loam, clay loam	CL	A-6	0	0	85-100	70-100	55-100	25-80	28-44	9-22
	22-30	Loam, sandy clay loam, clay loam	CL	A-6	0	0	85-100	70-100	55-100	25-80	28-44	9-22
	30-35	Loam, sandy clay loam, clay loam	CL	A-6	0	0	85-100	70-100	55-100	25-80	28-44	9-22
	35-43	Loam, sandy clay loam, clay loam	CL	A-6	0	0	85-100	70-100	55-100	25-80	28-44	9-22
	43-52	Fine sandy loam, loam, clay loam, sandy clay loam, sandy loam	SC	A-4	0	0	90-100	70-100	45-85	25-50	15-39	NP-18
	52-59	Loam, clay loam, fine sandy loam, sandy loam, sandy clay loam, gravelly loam, gravelly clay loam, gravelly sandy loam, gravelly sandy clay loam, loamy fine sand, sand	SC	A-2-4	0	0	90-100	70-100	45-95	10-40	10-39	NP-18
	59-73	Loam, clay loam, fine sandy loam, sandy loam, sandy clay loam, gravelly loam, gravelly clay loam, gravelly sandy loam, gravelly sandy clay loam, loamy fine sand, sand	SC	A-2-4	0	0	90-100	70-100	45-95	10-40	10-39	NP-18
	73-80	Loam, clay loam, fine sandy loam, sandy loam, sandy clay loam, gravelly loam, gravelly clay loam, gravelly sandy loam, gravelly sandy clay loam, loamy fine sand, sand	SC	A-2-4	0	0	90-100	70-100	45-95	10-40	10-39	NP-18

Table 17.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification Unified	Classification AASHTO	Fragments >10 inches	Fragments 3-10 inches	Percentage passing sieve number-- 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
5480: Muscotah, occasionally flooded--------	0-9	Silty clay loam	CL	A-7-6	0	0	100	100	95-100	85-95	36-56	16-33
	9-16	Silty clay loam	CL	A-7-6	0	0	100	100	95-100	85-95	36-56	16-33
	16-23	Silty clay loam	CL	A-7-6	0	0	100	100	95-100	85-95	36-56	16-33
	23-35	Silty clay, silty clay loam	CH	A-7-6	0	0	100	100	95-100	85-95	51-66	29-41
	35-44	Silty clay, silty clay loam	CH	A-7-6	0	0	100	100	95-100	85-95	51-66	29-41
	44-60	Silty clay, silty clay loam	CH	A-7-6	0	0	100	100	95-100	85-95	51-66	29-41
	60-70	Silty clay, silty clay loam	CH	A-7-6	0	0	100	100	95-100	85-95	51-66	29-41
	70-80	Silty clay, silty clay loam	CH	A-7-6	0	0	100	100	95-100	85-95	51-66	29-41
5540: Nodaway, occasionally flooded--------	0-7	Silt loam	CL	A-6	0	0	100	95-100	95-100	90-100	28-36	9-16
	7-14	Stratified silt loam, stratified silty clay loam	CL	A-6	0	0	100	95-100	95-100	90-100	28-39	9-18
	14-45	Stratified silt loam, stratified silty clay loam	CL	A-6	0	0	100	95-100	95-100	90-100	28-39	9-18
	45-60	Stratified silt loam, stratified silty clay loam	CL	A-6	0	0	100	95-100	95-100	90-100	28-39	9-18
5541: Nodaway, channeled------	0-7	Silt loam	CL	A-6	0	0	100	95-100	95-100	90-100	28-36	9-16
	7-14	Stratified silt loam, stratified silty clay loam	CL	A-6	0	0	100	95-100	95-100	90-100	28-39	9-18
	14-45	Stratified silt loam, stratified silty clay loam	CL	A-6	0	0	100	95-100	95-100	90-100	28-39	9-18
	45-60	Stratified silt loam, stratified silty clay loam	CL	A-6	0	0	100	95-100	95-100	90-100	28-39	9-18

Table 17.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
5736: Obert, frequently flooded--------	0-12	Silty clay loam	CL	A-7-6	0	0	100	100	95-100	90-100	36-44	16-22
	12-24	Silty clay loam, silt loam	CL	A-6	0	0	100	100	95-100	85-100	28-44	9-22
	24-60	Silty clay loam, silt loam, loam	CL	A-6	0	0	100	100	80-100	75-95	28-44	9-22
5742: Obert, occasionally flooded--------	0-12	Silty clay loam	CL	A-7-6	0	0	100	100	95-100	90-100	36-44	16-22
	12-24	Silty clay loam, silt loam	CL	A-6	0	0	100	100	95-100	85-100	28-44	9-22
	24-60	Silty clay loam, silt loam, loam	CL	A-6	0	0	100	100	80-100	75-95	28-44	9-22
5780: Olmitz----------	0-6	Loam	CL	A-6	0	0	100	90-100	85-95	60-80	28-36	9-16
	6-22	Loam, clay loam	CL	A-6	0	0	100	90-100	85-95	60-80	36-41	16-20
	22-32	Loam, clay loam	CL	A-6	0	0	100	90-100	85-95	60-80	36-41	16-20
	32-40	Clay loam	CL	A-6	0	0	100	90-100	85-95	60-80	36-41	16-20
	40-52	Clay loam	CL	A-6	0	0	100	90-100	85-95	60-80	36-41	16-20
	52-60	Clay loam	CL	A-7-6	0	0	100	90-100	85-95	60-80	36-43	16-21
6046: Pawnee----------	0-6	Clay loam	CL	A-7-6	0	0	95-100	95-100	85-100	70-90	36-48	15-25
	6-10	Clay loam	CL	A-7-6	0	0	95-100	95-100	85-100	70-90	36-46	16-23
	10-14	Clay loam	CL	A-7-6	0	0	95-100	95-100	85-100	70-90	36-46	16-23
	14-24	Clay	CH	A-7-6	0	0	95-100	95-100	85-100	70-85	56-66	33-41
	24-32	Clay	CH	A-7-6	0	0	95-100	95-100	85-100	70-85	56-66	33-41
	32-45	Clay	CH	A-7-6	0	0	95-100	95-100	85-100	70-85	56-66	33-41
	45-53	Clay	CH	A-7-6	0	0	95-100	95-100	85-100	70-85	56-66	33-41
	53-80	Clay loam, sandy clay loam, loam	CL	A-7-6	0	0	95-100	95-100	80-100	70-90	31-56	14-33
6130: Platte, occasionally flooded--------	0-5	Fine sandy loam	CL, ML, SC, SM	A-4	0	0	100	90-100	50-90	10-70	16-25	2-7
	5-8	Very fine sandy loam	CL, ML, SC, SM	A-4	0	0	100	90-100	50-90	10-70	16-25	2-7
	8-16	Very fine sandy loam	CL, ML, SC, SM	A-4	0	0	100	90-100	50-90	10-70	16-25	2-7
	16-80	Stratified coarse sand to gravelly coarse sand to gravelly sand	SM, SP, SP-SM	A-1-b	0	0	70-100	50-95	25-65	0-15	0-20	NP

Table 17.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
6138:												
Platte, frequently flooded--------	0-5	Fine sandy loam	CL, ML, SC, SM	A-4	0	0	100	90-100	50-90	10-70	16-25	2-7
	5-8	Very fine sandy loam	ML, SC, SM, CL	A-4	0	0	100	90-100	50-90	10-70	16-25	2-7
	8-16	Very fine sandy loam	CL, ML, SC, SM	A-4	0	0	100	90-100	50-90	10-70	16-25	2-7
	16-80	Stratified coarse sand to gravelly coarse sand to gravelly sand	SM, SP, SP-SM	A-1-b	0	0	70-100	50-95	25-65	0-15	0-20	NP
Barney, frequently flooded, channeled------	0-7	Silty clay loam	ML, CL, CL-ML	A-6	0	0	100	100	95-100	85-95	36-44	16-22
	7-10	Loam	ML, CL, CL-ML	A-4	0	0	95-100	90-100	85-95	60-95	21-36	4-16
	10-30	Fine sand, sand, loamy sand	SM, SP, SP-SM	A-1-b	0	0	90-100	90-100	30-70	3-15	0-10	NP-5
	30-80	Coarse sand, sand, fine sand	SM, SP, SP-SM	A-1-b	0	0	90-100	75-95	30-70	3-15	0-10	NP-5
6160:												
Pohocco---------	0-6	Silty clay loam	CL	A-6	0	0	100	100	100	95-100	36-44	16-22
	6-15	Silt loam, silty clay loam	CL, ML	A-6	0	0	100	100	100	95-100	30-44	11-22
	15-20	Silt loam, silty clay loam	CL, ML	A-6	0	0	100	100	100	95-100	30-44	11-22
	20-28	Silt loam, silty clay loam	CL, ML	A-6	0	0	100	100	100	95-100	30-44	11-22
	28-80	Silt loam	ML	A-6	0	0	100	100	100	95-100	30-36	11-16
6162:												
Pohocco---------	0-6	Silty clay loam	CL	A-6	0	0	100	100	100	95-100	36-44	16-22
	6-15	Silt loam, silty clay loam	CL, ML	A-6	0	0	100	100	100	95-100	30-44	11-22
	15-20	Silt loam, silty clay loam	CL, ML	A-6	0	0	100	100	100	95-100	30-44	11-22
	20-28	Silt loam, silty clay loam	CL, ML	A-6	0	0	100	100	100	95-100	30-44	11-22
	28-80	Silt loam	ML	A-6	0	0	100	100	100	95-100	30-36	11-16

Table 17.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
6170:												
Pohocco---------	0-6	Silty clay loam	CL	A-6	0	0	100	100	100	95-100	36-44	16-22
	6-15	Silt loam, silty clay loam	CL, ML	A-6	0	0	100	100	100	95-100	30-44	11-22
	15-20	Silt loam, silty clay loam	CL, ML	A-6	0	0	100	100	100	95-100	30-44	11-22
	20-28	Silt loam, silty clay loam	CL, ML	A-6	0	0	100	100	100	95-100	30-44	11-22
	28-80	Silt loam	ML	A-6	0	0	100	100	100	95-100	30-36	11-16
Pahuk-----------	0-6	Loamy fine sand	SC-SM, SM	A-2-4	0	0	100	100	50-80	12-35	10-23	NP-6
	6-14	Fine sand, loamy fine sand	SC-SM, SM, SP-SM	A-2-4	0	0	100	100	50-80	5-35	10-23	NP-6
	14-40	Fine sand, sand, loamy fine sand	SC-SM, SM, SP-SM	A-2-4	0	0	100	100	50-80	5-35	10-20	NP-3
	40-80	Fine sand, sand, loamy fine sand	SC-SM, SM, SP-SM	A-2-4	0	0	100	100	50-80	5-35	10-20	NP-3
6172:												
Pohocco---------	0-6	Silty clay loam	CL	A-6	0	0	100	100	100	95-100	36-44	16-22
	6-15	Silt loam, silty clay loam	CL, ML	A-6	0	0	100	100	100	95-100	30-44	11-22
	15-20	Silt loam, silty clay loam	CL, ML	A-6	0	0	100	100	100	95-100	30-44	11-22
	20-28	Silt loam, silty clay loam	CL, ML	A-6	0	0	100	100	100	95-100	30-44	11-22
	28-80	Silt loam	ML	A-6	0	0	100	100	100	95-100	30-36	11-16
Pahuk-----------	0-6	Loamy fine sand	SC-SM, SM	A-2-4	0	0	100	100	50-80	12-35	10-23	NP-6
	6-14	Fine sand, loamy fine sand	SC-SM, SM, SP-SM	A-2-4	0	0	100	100	50-80	5-35	10-23	NP-6
	14-40	Fine sand, sand, loamy fine sand	SC-SM, SM, SP-SM	A-2-4	0	0	100	100	50-80	5-35	10-20	NP-3
	40-80	Fine sand, sand, loamy fine sand	SC-SM, SM, SP-SM	A-2-4	0	0	100	100	50-80	5-35	10-20	NP-3

Table 17.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
6520: Saltillo, occasionally flooded--------	0-6	Silt loam	CL, CL-ML, ML	A-6	0	0	95-100	95-100	85-100	60-90	26-36	8-16
	6-17	Silt loam, silty clay loam, loam	CL, CL-ML, ML	A-6	0	0	95-100	95-100	85-100	60-100	28-48	9-25
	17-32	Stratified silt loam to silty clay loam, loam	CL, CL-ML, ML	A-6	0	0	95-100	95-100	85-100	60-100	28-48	9-25
	32-50	Stratified silt loam to silty clay loam, loam	CL, CL-ML, ML	A-6	0	0	95-100	95-100	85-100	60-100	28-48	9-25
	50-60	Stratified silt loam to silty clay loam, loam	CL, CL-ML, ML	A-6	0	0	95-100	95-100	85-100	60-100	28-48	9-25
	60-80	Stratified silt loam to silty clay loam, loam	CL, CL-ML, ML	A-6	0	0	95-100	95-100	85-100	60-100	28-48	9-25
6791: Scott-----------	0-6	Silt loam	CL, CL-ML, ML	A-6	0	0	100	100	100	95-100	28-36	9-16
	6-18	Silt loam	CL, CL-ML, ML	A-6	0	0	100	100	100	95-100	28-36	9-16
	18-28	Silty clay, clay	CH, CL	A-7-6	0	0	100	100	100	95-100	56-71	33-45
	28-42	Silty clay, clay	CH, CL	A-7-6	0	0	100	100	100	95-100	56-71	33-45
	42-56	Silty clay, clay	CH, CL	A-7-6	0	0	100	100	100	95-100	56-71	33-45
	56-80	Silty clay, clay	CH, CL	A-7-6	0	0	100	100	100	95-100	56-71	33-45
7069: Steinauer-------	0-6	Clay loam	CL	A-6	0	0-5	95-100	95-100	85-100	55-90	36-41	16-20
	6-15	Clay loam	CL	A-6	0	0-5	95-100	95-100	85-100	70-90	36-41	16-20
	15-41	Loam, clay loam	CL	A-6	0	0-5	95-100	95-100	85-100	60-75	34-44	14-22
	41-60	Loam, clay loam	CL	A-6	0	0-5	95-100	95-100	85-100	60-75	34-44	14-22
7290: Tomek-----------	0-11	Silt loam	CL, ML	A-6	0	0	100	100	100	95-100	30-45	5-20
	11-19	Silty clay loam	CL, ML	A-6	0	0	100	100	100	95-100	30-50	5-25
	19-54	Silty clay loam	CH	A-7-6	0	0	100	100	100	95-100	50-55	25-30
	54-80	Silty clay loam	CL, ML	A-7-6	0	0	100	100	100	95-100	35-50	10-25
7920: Wann, occasionally flooded--------	0-6	Fine sandy loam	SC-SM, SM	A-4	0	0	95-100	95-100	70-100	30-50	15-26	NP-8
	6-16	Fine sandy loam	SC-SM, SM	A-4	0	0	95-100	95-100	70-100	30-50	15-26	NP-8
	16-50	Sandy loam, fine sandy loam	SM, SC-SM	A-2-4	0	0	95-100	75-100	60-100	20-50	15-28	NP-9
	50-60	Stratified sandy loam to fine sandy loam to loamy sand to loam	SM	A-2-4	0	0	95-100	95-100	70-100	15-40	15-30	NP-11

Table 17.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
8120:												
Yutan-----------	0-6	Silty clay loam	CH, CL	A-7-6	0	0	100	100	95-100	90-100	44-48	22-25
	6-13	Silty clay loam, silty clay	CH, CL	A-7-6	0	0	100	100	95-100	90-100	42-50	21-27
	13-20	Silty clay loam	CL	A-7-6	0	0	100	100	95-100	90-100	38-44	17-22
	20-27	Silty clay loam	CL	A-7-6	0	0	100	100	95-100	90-100	38-44	17-22
	27-32	Silty clay loam	CL	A-7-6	0	0	100	100	95-100	90-100	38-44	17-22
	32-43	Silty clay loam, silt loam	CL	A-6	0	0	100	100	95-100	90-100	34-42	14-21
	43-63	Silt loam	CL	A-6	0	0	100	100	95-100	85-100	30-36	11-16
	63-80	Silt loam	CL	A-6	0	0	100	100	95-100	85-100	30-36	11-16
8124:												
Yutan-----------	0-6	Silty clay loam	CH, CL	A-7-6	0	0	100	100	95-100	90-100	44-48	22-25
	6-13	Silty clay loam, silty clay	CH, CL	A-7-6	0	0	100	100	95-100	90-100	42-50	21-27
	13-20	Silty clay loam	CL	A-7-6	0	0	100	100	95-100	90-100	38-44	17-22
	20-27	Silty clay loam	CL	A-7-6	0	0	100	100	95-100	90-100	38-44	17-22
	27-32	Silty clay loam	CL	A-7-6	0	0	100	100	95-100	90-100	38-44	17-22
	32-43	Silty clay loam, silt loam	CL	A-6	0	0	100	100	95-100	90-100	34-42	14-21
	43-63	Silt loam	CL	A-6	0	0	100	100	95-100	85-100	30-36	11-16
	63-80	Silt loam	CL	A-6	0	0	100	100	95-100	85-100	30-36	11-16
8130:												
Yutan-----------	0-6	Silty clay loam	CH, CL	A-7-6	0	0	100	100	95-100	90-100	44-48	22-25
	6-13	Silty clay loam, silty clay	CH, CL	A-7-6	0	0	100	100	95-100	90-100	42-50	21-27
	13-20	Silty clay loam	CL	A-7-6	0	0	100	100	95-100	90-100	38-44	17-22
	20-27	Silty clay loam	CL	A-7-6	0	0	100	100	95-100	90-100	38-44	17-22
	27-32	Silty clay loam	CL	A-7-6	0	0	100	100	95-100	90-100	38-44	17-22
	32-43	Silty clay loam, silt loam	CL	A-6	0	0	100	100	95-100	90-100	34-42	14-21
	43-63	Silt loam	CL	A-6	0	0	100	100	95-100	85-100	30-36	11-16
	63-80	Silt loam	CL	A-6	0	0	100	100	95-100	85-100	30-36	11-16
Aksarben--------	0-6	Silty clay loam	CL	A-6	0	0	100	100	95-100	90-100	36-44	16-22
	6-12	Silty clay loam	CL	A-6	0	0	100	100	95-100	90-100	36-44	16-22
	12-18	Silty clay loam, silty clay	CH, CL	A-7-6	0	0	100	100	95-100	90-100	51-58	29-35
	18-26	Silty clay loam, silty clay	CH, CL	A-7-6	0	0	100	100	95-100	90-100	51-58	29-35
	26-34	Silty clay loam, silty clay	CH, CL	A-7-6	0	0	100	100	95-100	90-100	51-58	29-35
	34-42	Silty clay loam, silty clay	CH, CL	A-7-6	0	0	100	100	95-100	90-100	51-58	29-35
	42-60	Silty clay loam	CL	A-7-6	0	0	100	100	95-100	90-100	43-51	23-29
	60-80	Silty clay loam, silt loam	CL	A-6	0	0	100	100	95-100	85-95	36-51	17-29

Table 17.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct	Pct					Pct	
8134:												
Yutan-----------	0-6	Silty clay loam	CH, CL	A-7-6	0	0	100	100	95-100	90-100	44-48	22-25
	6-13	Silty clay loam, silty clay	CH, CL	A-7-6	0	0	100	100	95-100	90-100	42-50	21-27
	13-20	Silty clay loam	CL	A-7-6	0	0	100	100	95-100	90-100	38-44	17-22
	20-27	Silty clay loam	CL	A-7-6	0	0	100	100	95-100	90-100	38-44	17-22
	27-32	Silty clay loam	CL	A-7-6	0	0	100	100	95-100	90-100	38-44	17-22
	32-43	Silty clay loam, silt loam	CL	A-6	0	0	100	100	95-100	90-100	34-42	14-21
	43-63	Silt loam	CL	A-6	0	0	100	100	95-100	85-100	30-36	11-16
	63-80	Silt loam	CL	A-6	0	0	100	100	95-100	85-100	30-36	11-16
Judson----------	0-6	Silt loam	CL	A-6	0	0	100	100	100	95-100	34-36	14-16
	6-12	Silty clay loam	CL	A-6	0	0	100	100	100	95-100	36-41	16-20
	12-22	Silty clay loam	CL	A-6	0	0	100	100	100	95-100	36-41	16-20
	22-31	Silty clay loam	CL	A-6	0	0	100	100	100	95-100	36-41	16-20
	31-43	Silty clay loam	CL	A-7-6	0	0	100	100	100	95-100	36-44	16-22
	43-54	Silty clay loam	CL	A-7-6	0	0	100	100	100	95-100	36-44	16-22
	54-69	Silty clay loam	CL	A-7-6	0	0	100	100	100	95-100	36-44	16-22
	69-80	Silty clay loam	CL	A-7-6	0	0	100	100	100	95-100	36-44	16-22
9900:												
Arents, earthen dam.												
9985:												
Gravel pits-----	0-60	Gravelly sand	GP-GM, SM, SP, SP-SM	A-1, A-2, A-3	---	0-5	45-100	40-100	0-80	0-40	0-14	NP
9998:												
Water.												

Table 18.--Physical Properties of the Soils

(Entries under "Erosion factors--T" apply to the entire profile. Entries under "Wind erodibility group" and "Wind erodibility index" apply only to the surface layer. Absence of an entry indicates that data were not estimated.)

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permea-bility (Ksat)	Available water capacity	Linear extensi-bility	Organic matter	Erosion factors Kw	Erosion factors Kf	Erosion factors T	Wind erodi-bility group	Wind erodi-bility index
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct					
1050:														
Aksarben------------	0-6	2-20	---	27-35	1.30-1.40	0.6-2	0.17-0.23	3.0-5.9	2.0-4.0	.32	.32	5	7	38
	6-12	2-20	---	27-35	1.30-1.40	0.6-2	0.17-0.23	3.0-5.9	2.0-4.0	.32	.32			
	12-18	2-10	---	35-42	1.20-1.45	0.2-0.6	0.16-0.18	3.0-5.9	1.0-2.0	.43	.43			
	18-26	2-10	---	35-42	1.20-1.45	0.2-0.6	0.16-0.18	3.0-5.9	1.0-2.0	.43	.43			
	26-34	2-10	---	35-42	1.20-1.45	0.2-0.6	0.16-0.18	3.0-5.9	1.0-2.0	.43	.43			
	34-42	2-10	---	35-42	1.20-1.45	0.2-0.6	0.16-0.18	3.0-5.9	1.0-2.0	.43	.43			
	42-60	2-20	---	27-35	1.30-1.40	0.6-2	0.18-0.20	3.0-5.9	0.5-1.0	.43	.43			
	60-80	2-30	---	20-35	1.30-1.40	0.6-2	0.18-0.20	3.0-5.9	0.5-1.0	.43	.43			
1100:														
Alda, occasionally flooded------------	0-11	52-80	---	2-12	1.40-1.60	0.6-2	0.20-0.22	0.0-2.9	2.0-4.0	.28	.28	4	5	56
	11-17	52-80	---	2-12	1.40-1.60	2-6	0.15-0.17	0.0-2.9	0.5-1.0	.20	.20			
	17-29	52-80	---	2-12	1.40-1.60	2-6	0.15-0.17	0.0-2.9	0.5-1.0	.20	.20			
	29-34	88-98	---	0-3	1.50-1.70	20-20	0.02-0.04	0.0-2.9	0.0-0.5	.10	.15			
	34-80	88-98	---	0-3	1.50-1.70	20-20	0.02-0.04	0.0-2.9	0.0-0.5	.10	.15			
1347:														
Barney, frequently flooded------------	0-7	2-20	---	27-35	1.40-1.50	0.6-2	0.20-0.24	0.0-2.9	2.0-4.0	.28	.28	5	4L	86
	7-10	26-52	---	10-20	1.40-1.50	0.6-2	0.20-0.24	0.0-2.9	2.0-4.0	.28	.28			
	10-30	86-98	---	0-5	1.70-1.90	6-20	0.02-0.04	0.0-2.9	0.0-0.5	.10	.10			
	30-80	86-98	---	0-5	1.70-1.90	6-20	0.02-0.04	0.0-2.9	0.0-0.5	.10	.10			
1616:														
Boel, occasionally flooded------------	0-11	72-88	---	2-12	1.50-1.70	6-20	0.10-0.12	0.0-2.9	1.0-2.0	.17	.17	5	2	134
	11-15	52-88	---	2-20	1.50-1.60	6-20	0.05-0.10	0.0-2.9	0.0-0.5	.20	.20			
	15-60	---	---	1-6	1.50-1.70	6-20	0.05-0.10	0.0-2.9	0.0-0.5	.20	.20			
1873:														
Burchard------------	0-13	20-45	---	27-30	1.25-1.45	0.2-0.6	0.17-0.19	3.0-5.9	2.0-4.0	.28	.28	5	6	48
	13-19	20-45	---	27-35	1.40-1.60	0.2-0.6	0.15-0.17	3.0-5.9	0.5-1.0	.37	.37			
	19-29	20-45	---	24-30	1.40-1.60	0.2-0.6	0.15-0.17	3.0-5.9	0.5-1.0	.37	.37			
	29-37	20-45	---	24-30	1.40-1.60	0.2 0.6	0.15-0.17	3.0-5.9	0.5-1.0	.37	.37			
	37-60	20-45	---	24-30	1.55-1.65	0.2-0.6	0.14-0.16	3.0 5.9	0.0-0.5	.37	.37			
Steinauer-----------	0-6	20-45	---	27-32	1.20-1.35	0.2-0.6	0.19-0.22	3.0-5.9	0.5-2.0	.32	.32	5	4L	86
	6-15	20-45	---	27-32	1.30-1.50	0.2-0.6	0.17-0.19	3.0-5.9	0.5-1.0	.37	.37			
	15-41	20-52	---	24-35	1.30-1.65	0.2-0.6	0.16-0.19	3.0-5.9	0.0-0.5	.37	.37			
	41-60	20-52	---	24-35	1.30-1.65	0.2-0.6	0.16-0.19	3.0-5.9	0.0-0.5	.37	.37			
1879:														
Burchard------------	0-13	20-45	---	27-30	1.25-1.45	0.2-0.6	0.17-0.19	3.0-5.9	2.0-4.0	.28	.28	5	6	48
	13-19	20-45	---	27-35	1.40-1.60	0.2-0.6	0.15-0.17	3.0-5.9	0.5-1.0	.37	.37			
	19-29	20-45	---	24-30	1.40-1.60	0.2-0.6	0.15-0.17	3.0-5.9	0.5-1.0	.37	.37			
	29-37	20-45	---	24-30	1.40-1.60	0.2-0.6	0.15-0.17	3.0-5.9	0.5-1.0	.37	.37			
	37-60	20-45	---	24 30	1.55-1.65	0.2-0.6	0.14-0.16	3.0-5.9	0.0-0.5	.37	.37			
Steinauer-----------	0-6	20-45	---	27-32	1.20-1.35	0.2-0.6	0.19-0.22	3.0-5.9	0.5-2.0	.32	.32	5	4L	86
	6-15	20-45	---	27-32	1.30-1.50	0.2-0.6	0.17-0.19	3.0-5.9	0.5-1.0	.37	.37			
	15-41	20-52	---	24-35	1.30-1.65	0.2-0.6	0.16-0.19	3.0-5.9	0.0-0.5	.37	.37			
	41-60	20-52	---	24-35	1.30-1.65	0.2-0.6	0.16-0.19	3.0-5.9	0.0-0.5	.37	.37			

Table 18.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors Kw	Kf	T	Wind erodi- bility group	Wind erodi- bility index
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct					
2420:														
Deroin, severely eroded------------	0-7	5-20	---	27-40	1.20-1.40	0.2-0.6	0.21-0.23	3.0-5.9	1.0-3.0	.37	.37	4	7	38
	7-12	5-30	---	27-35	1.35-1.45	0.2-0.6	0.17-0.20	3.0-5.9	0.0-1.0	.43	.43			
	12-18	5-30	---	27-35	1.35-1.45	0.2-0.6	0.17-0.20	3.0-5.9	0.0-1.0	.43	.43			
	18-40	5-30	---	27-35	1.35-1.45	0.2-0.6	0.17-0.20	3.0-5.9	0.0-1.0	.43	.43			
	40-50	10-45	---	24-32	1.30-1.50	0.2-0.6	0.16-0.20	3.0-5.9	0.0-0.5	.43	.43			
	50-80	10-45	---	24-32	1.30-1.50	0.2-0.6	0.16-0.20	3.0-5.9	0.0-0.5	.43	.43			
2830:														
Filbert-------------	0-5	2-20	---	18-27	1.20-1.40	0.6-2	0.22-0.24	3.0-5.9	2.0-4.0	.37	.37	3	6	48
	5-7	2-20	---	18-27	1.20-1.40	0.6-2	0.22-0.24	3.0-5.9	2.0-4.0	.37	.37			
	7-12	2-20	---	14-20	1.20-1.40	0.6-2	0.22-0.24	3.0-5.9	1.0-2.0	.37	.37			
	12-15	2-20	---	14-20	1.20-1.40	0.6-2	0.22-0.24	3.0-5.9	1.0-2.0	.37	.37			
	15-25	2-15	---	45-55	1.10-1.20	0.0015-0.06	0.11-0.13	6.0-8.9	0.5-1.0	.37	.37			
	25-36	2-15	---	45-55	1.10-1.20	0.0015-0.06	0.11-0.13	6.0-8.9	0.5-1.0	.37	.37			
	36-43	2-15	---	45-55	1.10-1.20	0.0015-0.06	0.11-0.13	6.0-8.9	0.5-1.0	.37	.37			
	43-53	2-15	---	45-55	1.10-1.20	0.0015-0.06	0.11-0.13	6.0-8.9	0.5-1.0	.37	.37			
	53-62	2-15	---	45-55	1.10-1.20	0.0015-0.06	0.11-0.13	6.0-8.9	0.5-1.0	.37	.37			
	62-80	2-10	---	35-45	1.10-1.25	0.0015-0.06	0.11-0.13	6.0-8.9	0.5-1.0	.37	.37			
2844:														
Fillmore------------	0-7	2-20	---	18-27	1.20-1.40	0.6-2	0.21-0.24	0.0-2.9	2.0-4.0	.37	.37	3	6	48
	7-14	2-20	---	18-27	1.20-1.40	0.6-2	0.21-0.24	0.0-2.9	2.0-4.0	.37	.37			
	14-22	2-20	---	14-20	1.20-1.40	0.6-2	0.21-0.24	0.0-2.9	0.5-1.0	.37	.37			
	22-30	2-15	---	45-55	1.10-1.30	0.0015-0.06	0.11-0.14	6.0-8.9	1.0-2.0	.37	.37			
	30-42	2-15	---	45-55	1.10-1.30	0.0015-0.06	0.11-0.14	6.0-8.9	1.0-2.0	.37	.37			
	42-54	2-15	---	45-55	1.10-1.30	0.0015-0.06	0.11-0.14	6.0-8.9	1.0-2.0	.37	.37			
	54-62	2-15	---	45-55	1.10-1.30	0.0015-0.06	0.11-0.14	6.0-8.9	1.0-2.0	.37	.37			
	62-80	2-15	---	45-55	1.10-1.30	0.0015-0.06	0.11-0.14	6.0-8.9	1.0-2.0	.37	.37			
2863:														
Fluvaquents---------	0-20	2-12	---	35-60	1.00-1.40	0.06-0.2	0.13-0.17	3.0-5.9	2.0-8.0	.32	.32	5	8	0
	20-80	---	---	---	---	0.01-20	0.16-0.22	---	---	---	---			
3025:														
Gibbon, occasionally flooded------------	0-5	2-50	---	20-27	1.20-1.40	0.6-2	0.21-0.23	0.0-2.9	2.0-4.0	.32	.32	5	4L	86
	5-19	2-50	---	20-27	1.20-1.40	0.6-2	0.21-0.23	0.0-2.9	2.0-4.0	.32	.32			
	19-24	2-50	---	20-27	1.20-1.40	0.6-2	0.21-0.23	0.0-2.9	1.0-3.0	.32	.32			
	24-30	2-40	---	20-27	1.30-1.50	0.6-2	0.18-0.22	3.0-5.9	0.5-1.0	.32	.32			
	30-42	2-55	---	20-27	1.40-1.60	0.6-2	0.18-0.22	0.0-2.9	0.5-1.0	.32	.32			
	42-60	2-55	---	20-27	1.40-1.60	0.6-2	0.18-0.22	0.0-2.9	0.5-1.0	.32	.32			
3038:														
Gibbon, occasionally flooded------------	0-5	2-12	---	20-27	1.20-1.40	0.6-2	0.21-0.23	0.0-2.9	2.0-4.0	.32	.32	5	4L	86
	5-19	2-12	---	20-27	1.20-1.40	0.6-2	0.21-0.23	0.0-2.9	2.0-4.0	.32	.32			
	19-24	2-12	---	20-27	1.20-1.40	0.6-2	0.21-0.23	0.0-2.9	1.0-3.0	.32	.32			
	24-30	2-50	30-80	20-27	1.30-1.50	0.6-2	0.18-0.22	3.0-5.9	0.5-1.0	.32	.32			
	30-42	2-50	---	20-27	1.40-1.60	0.6-2	0.18-0.22	0.0-2.9	0.5-1.0	.32	.32			
	42-60	2-50	---	20-27	1.40-1.60	0.6-2	0.18-0.22	0.0-2.9	0.5-1.0	.32	.32			
Saltine, occasionally flooded------------	0-7	2-10	---	27-35	1.20-1.30	0.2-0.6	0.17-0.23	6.0-8.9	0.5-2.0	.37	.37	5	4L	86
	7-12	2-40	---	18-40	1.20-1.30	0.6-2	0.17-0.22	3.0-5.9	0.0-0.5	.43	.43			
	12-30	2-40	---	18-40	1.20-1.30	0.6-2	0.17-0.22	3.0-5.9	0.0-0.5	.43	.43			
	30-48	2-12	---	20-45	1.30-1.40	0.2-0.6	0.10-0.22	6.0-8.9	0.0-0.5	.43	.43			
	48-55	5-75	---	20-40	1.40-1.50	0.2-2	0.18-0.22	3.0-5.9	0.0-0.5	.43	.43			
	55-60	5-75	---	20-40	1.40-1.50	0.2-2	0.18-0.22	3.0-5.9	0.0-0.5	.43	.43			

Table 18.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors Kw	Kf	T	Wind erodi- bility group	Wind erodi- bility index
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct					
3421:														
Hedville------------	0-10	40-80	---	8-20	1.30-1.50	0.6-2	0.14-0.18	0.0-2.9	1.0-4.0	.20	.20	2	5	56
	10-16	26-88	---	6-20	1.45-1.65	0.6-2	0.14-0.18	0.0-2.9	1.0-4.0	.28	.28			
	16-22	---	---	---	---	0.06-0.2	---	---	---	---	---			
3830:														
Ida----------------	0-4	2-12	---	18-25	1.20-1.30	0.6-2	0.20-0.22	0.0-2.9	2.0-3.0	.32	.32	5	4L	86
	4-8	2-12	---	18-25	1.20-1.30	0.6-2	0.20-0.22	0.0-2.9	0.0-0.5	.43	.43			
	8-18	2-12	---	18-25	1.20-1.30	0.6-2	0.20-0.22	0.0-2.9	0.0-0.5	.43	.43			
	18-40	2-12	---	18-25	1.20-1.30	0.6-2	0.20-0.22	0.0-2.9	0.0-0.5	.43	.43			
	40-60	2-12	---	18-25	1.20-1.30	0.6-2	0.20-0.22	0.0-2.9	0.0-0.5	.43	.43			
Steinauer-----------	0-6	20-45	---	27-32	1.20-1.35	0.2-0.6	0.19-0.22	3.0-5.9	0.5-2.0	.32	.32	5	4L	86
	6-15	20-45	---	27-32	1.30-1.50	0.2-0.6	0.17-0.19	3.0-5.9	0.5-1.0	.37	.37			
	15-41	20-52	---	24-35	1.30-1.65	0.2-0.6	0.16-0.19	3.0-5.9	0.0-0.5	.37	.37			
	41-60	20-52	---	24-35	1.30-1.65	0.2-0.6	0.16-0.19	3.0-5.9	0.0-0.5	.37	.37			
3890:														
Inglewood, rarely flooded------------	0-5	72-88	---	2-10	1.45-1.65	6-20	0.10-0.12	0.0-2.9	0.5-1.0	.17	.17	5	2	134
	5-22	70-95	---	1-8	1.45-1.65	6-20	0.07-0.18	0.0-2.9	0.0-0.5	.17	.17			
	22-30	70-95	---	1-8	1.45-1.65	6-20	0.07-0.18	0.0-2.9	0.0-0.5	.17	.17			
	30-40	70-95	---	1-8	1.45-1.65	6-20	0.07-0.18	0.0-2.9	0.0-0.5	.17	.17			
	40-50	85-99	---	0-5	1.50-1.70	6-20	0.07-0.12	0.0-2.9	0.0-0.5	.17	.17			
	50-80	85-99	---	0-5	1.50-1.70	6-20	0.07-0.12	0.0-2.9	0.0-0.5	.17	.17			
4104:														
Judson--------------	0-6	2-10	---	24-27	1.20-1.40	0.6-2	0.21-0.23	0.0-2.9	2.0-4.0	.28	.28	5	6	48
	6-12	2-10	---	27-32	1.25-1.45	0.6-2	0.21-0.23	3.0-5.9	2.0-4.0	.28	.28			
	12-22	2-10	---	27-32	1.25-1.45	0.6-2	0.21-0.23	3.0-5.9	2.0-4.0	.28	.28			
	22-31	2-10	---	27-32	1.25-1.45	0.6-2	0.21-0.23	3.0-5.9	2.0-4.0	.28	.28			
	31-43	2-10	---	27-35	1.25-1.45	0.6-2	0.21-0.23	3.0-5.9	1.0-3.0	.43	.43			
	43-54	2-10	---	27-35	1.25-1.45	0.6-2	0.21-0.23	3.0-5.9	0.5-2.0	.43	.43			
	54-69	2-10	---	27-35	1.25-1.45	0.6-2	0.21-0.23	3.0-5.9	0.5-2.0	.43	.43			
	69-80	2-10	---	27-35	1.25-1.45	0.6-2	0.21-0.23	3.0-5.9	0.5-2.0	.43	.43			
4106:														
Judson--------------	0-6	2-10	---	24-27	1.20-1.40	0.6-2	0.21-0.23	0.0-2.9	2.0-4.0	.28	.28	5	6	48
	6-12	2-10	---	27-32	1.25-1.45	0.6-2	0.21-0.23	3.0-5.9	2.0-4.0	.28	.28			
	12-22	2-10	---	27-32	1.25-1.45	0.6-2	0.21-0.23	3.0-5.9	2.0-4.0	.28	.28			
	22-31	2-10	---	27-32	1.25-1.45	0.6-2	0.21-0.23	3.0-5.9	2.0-4.0	.28	.28			
	31-43	2-10	---	27-35	1.25-1.45	0.6-2	0.21-0.23	3.0-5.9	1.0-3.0	.43	.43			
	43-54	2-10	---	27-35	1.25-1.45	0.6-2	0.21-0.23	3.0-5.9	0.5-2.0	.43	.43			
	54-69	2-10	---	27-35	1.25-1.45	0.6-2	0.21-0.23	3.0-5.9	0.5-2.0	.43	.43			
	69-80	2-10	---	27-35	1.25-1.45	0.6-2	0.21-0.23	3.0-5.9	0.5-2.0	.43	.43			
4250:														
Kenridge, occasionally flooded-----------	0-8	2-10	---	27-32	1.20-1.40	0.2-0.6	0.21-0.23	3.0-5.9	2.0-4.0	.28	.28	5	7	38
	8-20	2-10	---	27-32	1.20-1.40	0.2-0.6	0.21-0.23	3.0-5.9	2.0-4.0	.28	.28			
	20-36	2-10	---	27-35	1.25-1.45	0.2-0.6	0.18-0.20	3.0-5.9	1.0-4.0	.32	.32			
	36-46	2-10	---	27-35	1.25-1.45	0.2-0.6	0.18-0.20	3.0-5.9	1.0-4.0	.32	.32			
	46-60	2-10	---	27-35	1.25-1.45	0.2-0.6	0.18-0.20	3.0-5.9	1.0-4.0	.32	.32			
	60-80	2-10	---	27-35	1.25-1.45	0.2-0.6	0.14-0.16	3.0-5.9	0.5-1.0	.37	.37			
4404:														
Lamo, occasionally flooded-----------	0-5	2-18	---	18-35	1.10-1.30	0.2-0.6	0.19-0.23	3.0-5.9	2.0-4.0	.32	.32	5	4L	86
	5-25	2-18	---	18-35	1.10-1.30	0.2-0.6	0.19-0.23	3.0-5.9	2.0-4.0	.32	.32			
	25-36	2-18	---	18-35	1.25-1.45	0.2-0.6	0.19-0.23	3.0-5.9	1.0-3.0	.32	.32			
	36-44	2-18	---	25-35	1.25-1.45	0.2-0.6	0.18-0.22	3.0-5.9	0.5-1.0	.43	.43			
	44-60	2-18	---	25-35	1.25-1.45	0.2-0.6	0.18-0.22	3.0-5.9	0.5-1.0	.43	.43			

Table 18.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permea-bility (Ksat)	Available water capacity	Linear extensi-bility	Organic matter	Erosion factors Kw	Kf	T	Wind erodi-bility group	Wind erodi-bility index
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct					
4583:														
Lex, occasionally flooded------------	0-7	20-52	---	15-35	1.25-1.45	0.6-2	0.20-0.22	0.0-2.9	1.0-3.0	.28	.28	4	4L	86
	7-17	20-52	---	15-35	1.25-1.45	0.6-2	0.20-0.22	0.0-2.9	1.0-3.0	.28	.28			
	17-19	20-52	---	15-35	1.25-1.45	0.6-2	0.20-0.22	0.0-2.9	1.0-3.0	.28	.28			
	19-27	26-80	---	18-32	1.30-1.70	0.2-2	0.15-0.22	0.0-2.9	0.5-1.0	.37	.37			
	27-60	88-98	---	1-5	1.55-1.75	20-20	0.02-0.06	0.0-2.9	0.0-0.5	.05	.10			
4853:														
Malcolm-------------	0-7	2-12	---	18-27	1.20-1.30	0.6-2	0.22-0.24	0.0-2.9	1.0-3.0	.32	.32	5	5	56
	7-12	2-12	---	24-35	1.30-1.40	0.6-2	0.18-0.22	3.0-5.9	0.5-2.0	.43	.43			
	12-20	2-12	---	24-35	1.30-1.40	0.6-2	0.18-0.22	3.0-5.9	0.5-2.0	.43	.43			
	20-28	2-12	---	24-35	1.30-1.40	0.6-2	0.18-0.22	3.0-5.9	0.5-2.0	.43	.43			
	28-60	8-70	---	7-27	1.35-1.45	0.6-2	0.17-0.22	0.0-2.9	0.0-0.5	.43	.43			
4860:														
Malmo, severely eroded------------	0-6	20-45	---	35-40	1.35-1.45	0.06-0.2	0.17-0.19	6.0-8.9	1.0-3.0	.37	.37	4	4	86
	6-15	20-50	---	35-50	1.20-1.40	0.01-0.06	0.10-0.14	6.0-8.9	0.5-1.0	.32	.32			
	15-25	20-50	---	35-50	1.20-1.40	0.01-0.06	0.10-0.14	6.0-8.9	0.5-1.0	.32	.32			
	25-39	20-50	---	35-50	1.20-1.40	0.01-0.06	0.10-0.14	6.0-8.9	0.5-1.0	.32	.32			
	39-43	20-50	---	35-50	1.30-1.50	0.01-0.06	0.10-0.14	6.0-8.9	0.5-1.0	.28	.32			
	43-54	20-45	---	20-45	1.40-1.60	0.06-0.2	0.09-0.17	3.0-5.9	0.5-1.0	.32	.32			
	54-80	20-50	---	20-45	1.45-1.65	0.06-0.2	0.09-0.19	3.0-5.9	0.1-0.5	.32	.32			
5388:														
Morrill-------------	0-6	26-52	---	15-27	1.30-1.65	0.6-2	0.15-0.22	0.0-2.9	1.0-3.0	.28	.28	5	6	48
	6-12	20-52	---	18-35	1.30-1.40	0.6-2	0.14-0.21	0.0-2.9	1.0-2.0	.28	.28			
	12-22	20-75	---	18-35	1.40-1.60	0.6-2	0.15-0.19	3.0-6.0	0.5-1.0	.32	.32			
	22-30	20-75	---	18-35	1.40-1.60	0.2-0.6	0.15-0.19	3.0-6.0	0.5-1.0	.32	.32			
	30-35	20-75	---	18-35	1.40-1.60	0.2-0.6	0.15-0.19	3.0-6.0	0.5-1.0	.32	.32			
	35-43	20-75	---	18-35	1.40-1.60	0.2-0.6	0.15-0.19	3.0-6.0	0.5-1.0	.32	.32			
	43-52	20-80	---	2-35	1.35-1.45	2-6	0.13-0.15	0.0-2.9	0.0-0.5	.24	.24			
	52-59	25-98	---	1-30	1.50-1.70	2-6	0.05-0.16	0.0-2.9	0.0-0.5	.15	.17			
	59-73	25-98	---	1-30	1.50-1.70	2-6	0.05-0.16	0.0-2.9	0.0-0.5	.15	.17			
	73-80	25-98	---	1-30	1.50-1.70	2-6	0.05-0.16	0.0-2.9	0.0-0.5	.15	.17			
5480:														
Muscotah, occasionally flooded-----------	0-9	2-8	---	27-40	1.30-1.40	0.2-0.6	0.21-0.23	3.0-5.9	2.0-4.0	.37	.37	5	7	38
	9-16	2-8	---	27-40	1.30-1.40	0.2-0.6	0.21-0.23	3.0-5.9	2.0-4.0	.37	.37			
	16-23	2-8	---	27-40	1.30-1.40	0.2-0.6	0.21-0.23	3.0-5.9	2.0-4.0	.37	.37			
	23-35	2-8	---	35-50	1.20-1.30	0.06-0.2	0.11-0.20	6.0-8.9	1.0-2.0	.28	.28			
	35-44	2-8	---	35-50	1.20-1.30	0.06-0.2	0.11-0.20	6.0-8.9	1.0-2.0	.28	.28			
	44-60	2-8	---	35-50	1.20-1.30	0.06-0.2	0.11-0.20	6.0-8.9	1.0-2.0	.28	.28			
	60-70	2-8	---	35-50	1.20-1.30	0.01-0.06	0.10-0.20	6.0-8.9	0.5-1.0	.28	.28			
	70-80	2-8	---	35-50	1.20-1.30	0.01-0.06	0.10-0.20	6.0-8.9	0.5-1.0	.28	.28			
5540:														
Nodaway, occasionally flooded-----------	0-7	2-10	---	18-27	1.25-1.35	0.6-2	0.20-0.23	0.0-2.9	2.0-3.0	.32	.32	5	6	48
	7-14	2-10	---	18-28	1.25-1.35	0.6-2	0.20-0.23	3.0-5.9	0.0-0.5	.43	.43			
	14-45	2-10	---	18-28	1.25-1.35	0.6-2	0.20-0.23	3.0-5.9	0.0-0.5	.43	.43			
	45-60	2-10	---	18-28	1.25-1.35	0.6-2	0.20-0.23	3.0-5.9	0.0-0.5	.43	.43			
5541:														
Nodaway, channeled--	0-7	2-10	---	18-27	1.25-1.35	0.6-2	0.20-0.23	0.0-2.9	2.0-3.0	.32	.32	5	6	48
	7-14	2-10	---	18-28	1.25-1.35	0.6-2	0.20-0.23	3.0-5.9	0.0-0.5	.43	.43			
	14-45	2-10	---	18-28	1.25-1.35	0.6-2	0.20-0.23	3.0-5.9	0.0-0.5	.43	.43			
	45-60	2-10	---	18-28	1.25-1.35	0.6-2	0.20-0.23	3.0-5.9	0.0-0.5	.43	.43			

Table 18.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Linear extensibility	Organic matter	Erosion factors Kw	Kf	T	Wind erodibility group	Wind erodibility index
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct					
5736:														
Obert, frequently flooded------------	0-12	2-10	---	27-35	1.20-1.30	0.2-0.6	0.21-0.23	6.0-8.9	2.0-4.0	.28	.28	5	8	0
	12-24	2-12	---	18-35	1.25-1.45	0.2-0.6	0.18-0.20	6.0-8.9	1.0-2.0	.32	.32			
	24-60	2-50	---	18-35	1.25-1.45	0.2-2	0.17-0.20	3.0-5.9	0.5-1.0	.43	.43			
5742:														
Obert, occasionally flooded------------	0-12	2-10	---	27-35	1.20-1.30	0.2-0.6	0.21-0.23	6.0-8.9	2.0-4.0	.28	.28	5	8	0
	12-24	2-12	---	18-35	1.25-1.45	0.2-0.6	0.18-0.20	6.0-8.9	1.0-2.0	.32	.32			
	24-60	2-50	---	18-35	1.25-1.45	0.2-2	0.17-0.20	3.0-5.9	0.5-1.0	.43	.43			
5780:														
Olmitz--------------	0-6	26-52	---	18-27	1.25-1.45	0.6-2	0.19-0.21	3.0-5.9	3.0-4.0	.24	.24	5	6	48
	6-22	20-45	---	18-32	1.30-1.50	0.6-2	0.19-0.21	3.0-5.9	2.0-3.0	.28	.28			
	22-32	20-45	---	18-32	1.30-1.50	0.6-2	0.19-0.21	3.0-5.9	2.0-3.0	.28	.28			
	32-40	20-45	---	27-32	1.30-1.50	0.6-2	0.15-0.17	3.0-5.9	1.0-2.0	.28	.28			
	40-52	20-45	---	27-32	1.30-1.50	0.6-2	0.15-0.17	3.0-5.9	1.0-2.0	.28	.28			
	52-60	20-45	---	27-34	1.30-1.50	0.6-2	0.15-0.17	3.0-5.9	1.0-2.0	.28	.28			
6046:														
Pawnee--------------	0-6	20-45	---	27-40	1.30-1.60	0.2-0.6	0.17-0.19	3.0-5.9	2.0-4.0	.37	.37	5	6	48
	6-10	20-45	---	27-40	1.30-1.60	0.2-0.6	0.17-0.19	3.0-5.9	2.0-3.0	.37	.37			
	10-14	20-45	---	27-40	1.30-1.60	0.06-0.2	0.17-0.19	3.0-5.9	2.0-3.0	.37	.37			
	14-24	15-45	---	40-50	1.30-1.60	0.01-0.06	0.09-0.11	6.0-8.9	1.0-2.0	.37	.37			
	24-32	15-45	---	40-50	1.30-1.60	0.01-0.06	0.09-0.11	6.0-8.9	1.0-2.0	.37	.37			
	32-45	15-45	---	40-50	1.30-1.60	0.01-0.06	0.09-0.11	6.0-8.9	1.0-2.0	.37	.37			
	45-53	15-45	---	40-50	1.40-1.70	0.01-0.06	0.09-0.11	6.0-8.9	0.5-1.0	.37	.37			
	53-80	20-75	---	15-40	1.40-1.70	0.06-0.2	0.14-0.16	6.0-8.9	0.0-0.5	.37	.37			
6130:														
Platte, occasionally flooded------------	0-5	52-80	---	5-15	1.45-1.65	2-6	0.16-0.18	0.0-2.9	1.0-3.0	.20	.20	3	3	86
	5-8	52-80	---	5-15	1.45-1.65	2-6	0.16-0.18	0.0-2.9	1.0-3.0	.20	.20			
	8-16	52-80	---	5-15	1.45-1.65	2-6	0.16-0.18	0.0-2.9	1.0-3.0	.20	.20			
	16-80	---	---	0-3	1.55-1.70	20-20	0.02-0.04	0.0-2.9	0.0-0.5	.05	.10			
6138:														
Platte, frequently flooded------------	0-5	52-80	---	5-15	1.45-1.65	2-6	0.16-0.18	0.0-2.9	1.0-3.0	.20	.20	3	3	86
	5-8	52-80	---	5-15	1.45-1.65	2-6	0.16-0.18	0.0-2.9	1.0-3.0	.20	.20			
	8-16	52-80	---	5-15	1.45-1.65	2-6	0.16-0.18	0.0-2.9	1.0-3.0	.20	.20			
	16-80	---	---	0-3	1.55-1.70	20-20	0.02-0.04	0.0-2.9	0.0-0.5	.05	.10			
Barney, frequently flooded, channeled-	0-7	2-20	---	27-35	1.40-1.50	0.6-2	0.20-0.24	0.0-2.9	2.0-4.0	.28	.28	5	4L	86
	7-10	26-52	---	10-20	1.40-1.50	0.6-2	0.20-0.24	0.0-2.9	2.0-4.0	.28	.28			
	10-30	86-98	---	0-5	1.70-1.90	6-20	0.02-0.04	0.0-2.9	0.0-0.5	.10	.10			
	30-80	86-98	---	0-5	1.70-1.90	6-20	0.02-0.04	0.0-2.9	0.0-0.5	.10	.10			
6160:														
Pohocco-------------	0-6	2-10	---	27-35	1.35-1.40	0.6-2	0.21-0.23	3.0-5.9	0.5-2.0	.37	.37	5	7	38
	6-15	2-12	---	20-35	1.35-1.45	0.6-2	0.18-0.22	3.0-5.9	0.5-1.0	.43	.43			
	15-20	2-12	---	20-35	1.35-1.45	0.6-2	0.18-0.22	3.0-5.9	0.5-1.0	.43	.43			
	20-28	2-12	---	20-35	1.35-1.45	0.6-2	0.18-0.22	3.0-5.9	0.5-1.0	.43	.43			
	28-80	2-12	---	20-27	1.35-1.40	0.6-2	0.20-0.22	3.0-5.9	0.0-0.5	.43	.43			
6162:														
Pohocco-------------	0-6	2-10	---	27-35	1.35-1.40	0.6-2	0.21-0.23	3.0-5.9	0.5-2.0	.37	.37	5	7	38
	6-15	2-12	---	20-35	1.35-1.45	0.6-2	0.18-0.22	3.0-5.9	0.5-1.0	.43	.43			
	15-20	2-12	---	20-35	1.35-1.45	0.6-2	0.18-0.22	3.0-5.9	0.5-1.0	.43	.43			
	20-28	2-12	---	20-35	1.35-1.45	0.6-2	0.18-0.22	3.0-5.9	0.5-1.0	.43	.43			
	28-80	2-12	---	20-27	1.35-1.40	0.6-2	0.20-0.22	3.0-5.9	0.0-0.5	.43	.43			

Table 18.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors Kw	Kf	T	Wind erodi- bility group	Wind erodi- bility index
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct					
6170:														
Pohocco------------	0-6	2-10	---	27-35	1.35-1.40	0.6-2	0.21-0.23	3.0-5.9	0.5-2.0	.37	.37	5	7	38
	6-15	2-12	---	20-35	1.35-1.45	0.6-2	0.18-0.22	3.0-5.9	0.5-1.0	.43	.43			
	15-20	2-12	---	20-35	1.35-1.45	0.6-2	0.18-0.22	3.0-5.9	0.5-1.0	.43	.43			
	20-28	2-12	---	20-35	1.35-1.45	0.6-2	0.18-0.22	3.0-5.9	0.5-1.0	.43	.43			
	28-80	2-12	---	20-27	1.35-1.40	0.6-2	0.20-0.22	3.0-5.9	0.0-0.5	.43	.43			
Pahuk---------------	0-6	72-88	---	2-12	1.35-1.55	6-20	0.10-0.12	0.0-2.9	0.5-1.0	.17	.17	5	2	134
	6-14	72-95	---	1-12	1.45-1.65	6-20	0.06-0.10	0.0-2.9	0.0-0.5	.17	.17			
	14-40	72-98	---	0-8	1.50-1.70	6-20	0.05-0.07	0.0-2.9	0.0-0.5	.15	.15			
	40-80	72-98	---	0-8	1.50-1.70	6-20	0.05-0.07	0.0-2.9	0.0-0.5	.15	.15			
6172:														
Pohocco------------	0-6	2-10	---	27-35	1.35-1.40	0.6-2	0.21-0.23	3.0-5.9	0.5-2.0	.37	.37	5	7	38
	6-15	2-12	---	20-35	1.35-1.45	0.6-2	0.18-0.22	3.0-5.9	0.5-1.0	.43	.43			
	15-20	2-12	---	20-35	1.35-1.45	0.6-2	0.18-0.22	3.0-5.9	0.5-1.0	.43	.43			
	20-28	2-12	---	20-35	1.35-1.45	0.6-2	0.18-0.22	3.0-5.9	0.5-1.0	.43	.43			
	28-80	2-12	---	20-27	1.35-1.40	0.6-2	0.20-0.22	3.0-5.9	0.0-0.5	.43	.43			
Pahuk---------------	0-6	72-88	---	2-12	1.35-1.55	6-20	0.10-0.12	0.0-2.9	0.5-1.0	.17	.17	5	2	134
	6-14	72-95	---	1-12	1.45-1.65	6-20	0.06-0.10	0.0-2.9	0.0-0.5	.17	.17			
	14-40	72-98	---	0-8	1.50-1.70	6-20	0.05-0.07	0.0-2.9	0.0-0.5	.15	.15			
	40-80	72-98	---	0-8	1.50-1.70	6-20	0.05-0.07	0.0-2.9	0.0-0.5	.15	.15			
6520:														
Saltillo, occasionally flooded------------	0-6	2-12	---	15-30	1.30-1.40	0.6-2	0.20-0.24	0.0-2.9	0.5-2.0	.37	.37	5	8	0
	6-17	2-50	---	18-40	1.25-1.45	0.6-2	0.17-0.22	3.0-5.9	0.0-0.5	.43	.43			
	17-32	2-50	---	18-40	1.30-1.50	0.6-2	0.17-0.22	3.0-5.9	0.0-0.5	.43	.43			
	32-50	2-50	---	18-40	1.30-1.50	0.6-2	0.17-0.22	3.0-5.9	0.0-0.5	.43	.43			
	50-60	2-50	---	18-40	1.30-1.50	0.6-2	0.17-0.22	3.0-5.9	0.0-0.5	.43	.43			
	60-80	2-50	---	18-40	1.30-1.50	0.6-2	0.17-0.22	3.0-5.9	0.0-0.5	.43	.43			
6791:														
Scott---------------	0-6	2-20	---	18-27	1.25-1.40	0.6-2	0.21-0.24	0.0-2.9	2.0-4.0	.37	.37	3	6	48
	6-18	2-20	---	18-27	1.25-1.40	0.6-2	0.21-0.24	0.0-2.9	0.5-1.0	.37	.37			
	18-28	2-10	---	40-55	1.20-1.40	0.01-0.06	0.08-0.16	6.0-8.9	1.0-2.0	.37	.37			
	28-42	2-10	---	40-55	1.20-1.40	0.01-0.06	0.08-0.16	6.0-8.9	1.0-2.0	.37	.37			
	42-56	2-10	---	40-55	1.20-1.40	0.01-0.06	0.08-0.16	6.0-8.9	1.0-2.0	.37	.37			
	56-80	2-10	---	40-55	1.20-1.40	0.01-0.06	0.08-0.16	6.0-8.9	1.0-2.0	.37	.37			
7069:														
Steinauer-----------	0-6	20-45	---	27-32	1.20-1.35	0.2-0.6	0.19-0.22	3.0-5.9	0.5-2.0	.32	.32	5	4L	86
	6-15	20-45	---	27-32	1.30-1.50	0.2-0.6	0.17-0.19	3.0-5.9	0.5-1.0	.37	.37			
	15-41	20-52	---	24-35	1.30-1.65	0.2-0.6	0.16-0.19	3.0-5.9	0.0-0.5	.37	.37			
	41-60	20-52	---	24-35	1.30-1.65	0.2-0.6	0.16-0.19	3.0-5.9	0.0-0.5	.37	.37			
7290:														
Tomek---------------	0-11	---	---	20-27	1.20-1.40	0.6-2	0.22-0.24	3.0-5.9	2.0-4.0	.32	.32	5	6	48
	11-19	---	---	20-35	1.20-1.40	0.2-2	0.18-0.20	3.0-5.9	2.0-4.0	.43	.43			
	19-54	---	---	35-40	1.30-1.45	0.2-0.6	0.16-0.18	6.0-8.9	1.0-3.0	.43	.43			
	54-80	---	---	25-35	1.20-1.40	0.2-0.6	0.18-0.22	3.0-5.9	0.5-1.0	.43	.43			
7920:														
Wann, occasionally flooded------------	0-6	52-80	---	4-15	1.45-1.65	2-6	0.13-0.18	0.0-2.9	1.0-3.0	.20	.20	5	3	86
	6-16	52-80	---	4-15	1.45-1.65	2-6	0.13-0.18	0.0-2.9	1.0-3.0	.20	.20			
	16-50	52-80	---	3-18	1.45-1.65	2-6	0.11-0.17	0.0-2.9	0.5-1.0	.28	.28			
	50-60	26-88	---	3-20	1.50-1.70	2-6	0.05-0.17	0.0-2.9	0.0-0.5	.15	.15			

Table 18.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors Kw	Erosion factors Kf	Erosion factors T	Wind erodi- bility group	Wind erodi- bility index
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct					
8120:														
Yutan	0-6	2-10	---	35-40	1.20-1.40	0.2-0.6	0.16-0.19	3.0-5.9	0.5-2.0	.37	.37	5	4	86
	6-13	2-10	---	33-42	1.25-1.45	0.2-0.6	0.16-0.19	3.0-5.9	0.5-1.0	.43	.43			
	13-20	2-10	---	27-35	1.25-1.45	0.2-0.6	0.18-0.20	3.0-5.9	0.0-1.0	.43	.43			
	20-27	2-10	---	27-35	1.25-1.45	0.2-0.6	0.18-0.20	3.0-5.9	0.0-1.0	.43	.43			
	27-32	2-10	---	27-35	1.25-1.45	0.2-0.6	0.18-0.20	3.0-5.9	0.0-1.0	.43	.43			
	32-43	2-12	---	24-33	1.25-1.45	0.6-2	0.18-0.20	3.0-5.9	0.0-0.5	.43	.43			
	43-63	2-12	---	20-27	1.30-1.50	0.6-2	0.18-0.20	3.0-5.9	0.0-0.5	.43	.43			
	63-80	2-12	---	20-27	1.30-1.50	0.6-2	0.18-0.20	3.0-5.9	0.0-0.5	.43	.43			
8124:														
Yutan	0-6	2-10	---	35-40	1.20-1.40	0.2-0.6	0.16-0.19	3.0-5.9	0.5-2.0	.37	.37	5	4	86
	6-13	2-10	---	33-42	1.25-1.45	0.2-0.6	0.16-0.19	3.0-5.9	0.5-1.0	.43	.43			
	13-20	2-10	---	27-35	1.25-1.45	0.2-0.6	0.18-0.20	3.0-5.9	0.0-1.0	.43	.43			
	20-27	2-10	---	27-35	1.25-1.45	0.2-0.6	0.18-0.20	3.0-5.9	0.0-1.0	.43	.43			
	27-32	2-10	---	27-35	1.25-1.45	0.2-0.6	0.18-0.20	3.0-5.9	0.0-1.0	.43	.43			
	32-43	2-12	---	24-33	1.25-1.45	0.6-2	0.18-0.20	3.0-5.9	0.0-0.5	.43	.43			
	43-63	2-12	---	20-27	1.30-1.50	0.6-2	0.18-0.20	3.0-5.9	0.0-0.5	.43	.43			
	63-80	2-12	---	20-27	1.30-1.50	0.6-2	0.18-0.20	3.0-5.9	0.0-0.5	.43	.43			
8130:														
Yutan	0-6	2-10	---	35-40	1.20-1.40	0.2-0.6	0.16-0.19	3.0-5.9	0.5-2.0	.37	.37	5	4	86
	6-13	2-10	---	33-42	1.25-1.45	0.2-0.6	0.16-0.19	3.0-5.9	0.5-1.0	.43	.43			
	13-20	2-10	---	27-35	1.25-1.45	0.2-0.6	0.18-0.20	3.0-5.9	0.0-1.0	.43	.43			
	20-27	2-10	---	27-35	1.25-1.45	0.2-0.6	0.18-0.20	3.0-5.9	0.0-1.0	.43	.43			
	27-32	2-10	---	27-35	1.25-1.45	0.2-0.6	0.18-0.20	3.0-5.9	0.0-1.0	.43	.43			
	32-43	2-12	---	24-33	1.25-1.45	0.6-2	0.18-0.20	3.0-5.9	0.0-0.5	.43	.43			
	43-63	2-12	---	20-27	1.30-1.50	0.6-2	0.18-0.20	3.0-5.9	0.0-0.5	.43	.43			
	63-80	2-12	---	20-27	1.30-1.50	0.6-2	0.18-0.20	3.0-5.9	0.0-0.5	.43	.43			
Aksarben	0-6	2-20	---	27-35	1.30-1.40	0.6-2	0.17-0.23	3.0-5.9	2.0-4.0	.32	.32	5	7	38
	6-12	2-20	---	27-35	1.30-1.40	0.6-2	0.17-0.23	3.0-5.9	2.0-4.0	.32	.32			
	12-18	2-10	---	35-42	1.20-1.45	0.2-0.6	0.16-0.18	3.0-5.9	1.0-2.0	.43	.43			
	18-26	2-10	---	35-42	1.20-1.45	0.2-0.6	0.16-0.18	3.0-5.9	1.0-2.0	.43	.43			
	26-34	2-10	---	35-42	1.20-1.45	0.2-0.6	0.16-0.18	3.0-5.9	1.0-2.0	.43	.43			
	34-42	2-10	---	35-42	1.20-1.45	0.2-0.6	0.16-0.18	3.0-5.9	1.0-2.0	.43	.43			
	42-60	2-20	---	27-35	1.30-1.40	0.6-2	0.18-0.20	3.0-5.9	0.5-1.0	.43	.43			
	60-80	2-30	---	20-35	1.30-1.40	0.6-2	0.18-0.20	3.0-5.9	0.5-1.0	.43	.43			
8134:														
Yutan	0-6	2-10	---	35-40	1.20-1.40	0.2-0.6	0.16-0.19	3.0-5.9	0.5-2.0	.37	.37	5	4	86
	6-13	2-10	---	33-42	1.25-1.45	0.2-0.6	0.16-0.19	3.0-5.9	0.5-1.0	.43	.43			
	13-20	2-10	---	27-35	1.25-1.45	0.2-0.6	0.18-0.20	3.0-5.9	0.0-1.0	.43	.43			
	20-27	2-10	---	27-35	1.25-1.45	0.2-0.6	0.18-0.20	3.0-5.9	0.0-1.0	.43	.43			
	27-32	2-10	---	27-35	1.25-1.45	0.2-0.6	0.18-0.20	3.0-5.9	0.0-1.0	.43	.43			
	32-43	2-12	---	24-33	1.25-1.45	0.6-2	0.18-0.20	3.0-5.9	0.0-0.5	.43	.43			
	43-63	2-12	---	20-27	1.30-1.50	0.6-2	0.18-0.20	3.0-5.9	0.0-0.5	.43	.43			
	63-80	2-12	---	20-27	1.30-1.50	0.6-2	0.18-0.20	3.0-5.9	0.0-0.5	.43	.43			
Judson	0-6	2-10	---	24-27	1.20-1.40	0.6-2	0.21-0.23	0.0-2.9	2.0-4.0	.28	.28	5	6	48
	6-12	2-10	---	27-32	1.25-1.45	0.6-2	0.21-0.23	3.0-5.9	2.0-4.0	.28	.28			
	12-22	2-10	---	27-32	1.25-1.45	0.6-2	0.21-0.23	3.0-5.9	2.0-4.0	.28	.28			
	22-31	2-10	---	27-32	1.25-1.45	0.6-2	0.21-0.23	3.0-5.9	2.0-4.0	.28	.28			
	31-43	2-10	---	27-35	1.25-1.45	0.6-2	0.21-0.23	3.0-5.9	1.0-3.0	.43	.43			
	43-54	2-10	---	27-35	1.25-1.45	0.6-2	0.21-0.23	3.0-5.9	0.5-2.0	.43	.43			
	54-69	2-10	---	27-35	1.25-1.45	0.6-2	0.21-0.23	3.0-5.9	0.5-2.0	.43	.43			
	69-80	2-10	---	27-35	1.25-1.45	0.6-2	0.21-0.23	3.0-5.9	0.5-2.0	.43	.43			

Table 18.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors Kw	Erosion factors Kf	Erosion factors T	Wind erodi- bility group	Wind erodi- bility index
	In	Pct	Pct	Pct	g/cc	In/hr	In/in	Pct	Pct					
9900:														
Arents, earthen dam.														
9985:														
Gravel pits---------	0-60	---	---	0-8	1.70-2.00	6-20	0.02-0.09	0.0-2.9	0.0-0.5	.10	.17	2	8	0
9998:														
Water.														

Table 19.--Chemical Properties of the Soils

(Absence of an entry indicates that data were not estimated.)

Map symbol and soil name	Depth	Cation exchange capacity	Soil reaction	Calcium carbonate	Gypsum	Salinity	Sodium adsorption ratio
	In	meq/100 g	pH	Pct	Pct	mmhos/cm	
1050:							
Aksarben------------	0-6	25-35	5.1-6.5	0	0	0	0
	6-12	25-35	5.1-6.5	0	0	0	0
	12-18	25-35	5.1-6.5	0	0	0	0
	18-26	25-35	5.1-6.5	0	0	0	0
	26-34	25-35	5.1-6.5	0	0	0	0
	34-42	25-35	5.1-6.5	0	0	0	0
	42-60	25-35	5.6-6.5	0	0	0	0
	60-80	20-30	6.1-7.3	0	0	0	0
1100:							
Alda, occasionally flooded------------	0-11	10-30	6.6-8.4	0	0	0	0
	11-17	5.0-10	7.4-8.4	1-15	0	0.0-2.0	0-4
	17-29	5.0-10	7.4-8.4	1-15	0	0.0-2.0	0-4
	29-34	0.0-5.0	6.6-8.4	0	0	0	0
	34-80	0.0-5.0	6.6-8.4	0	0	0	0
1347:							
Barney, frequently flooded------------	0-7	11-22	6.6-8.4	0-5	0	0	0
	7-10	11-22	6.6-8.4	0-5	0	0	0
	10-30	0.0-4.0	6.6-7.8	0	0	0	0
	30-80	0.0-4.0	6.6-7.8	0	0	0	0
1616:							
Boel, occasionally flooded------------	0-11	4.0-11	6.6-8.4	0-5	0	0	0
	11-15	0.0-4.0	6.6-8.4	0-5	0	0	0
	15-60	0.0-4.0	6.6-8.4	0-5	0	0	0
1873:							
Burchard------------	0-13	15-25	5.6-7.3	0	0	0	0
	13-19	15-25	6.1-7.3	0	0	0	0
	19-29	15-25	7.4-8.4	5-10	0	0	0
	29-37	15-25	7.4-8.4	5-10	0	0	0
	37-60	10-20	7.4-8.4	1-15	0-2	0	0
Steinauer------------	0-6	15-25	7.4-8.4	5-10	0	0	0
	6-15	15-25	7.9-8.4	5-15	0	0	0
	15-41	15-25	7.9-8.4	5-15	0	0	0
	41-60	15-25	7.9-8.4	5-15	0	0	0
1879:							
Burchard------------	0-13	15-25	5.6-7.3	0	0	0	0
	13-19	15-25	6.1-7.3	0	0	0	0
	19-29	15-25	7.4-8.4	5-10	0	0	0
	29-37	15-25	7.4-8.4	5-10	0	0	0
	37-60	10-20	7.4-8.4	1-15	0-2	0	0
Steinauer------------	0-6	15-25	7.4-8.4	5-10	0	0	0
	6-15	15-25	7.9-8.4	5-15	0	0	0
	15-41	15-25	7.9-8.4	5-15	0	0	0
	41-60	15-25	7.9-8.4	5-15	0	0	0

Table 19.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation exchange capacity	Soil reaction	Calcium carbonate	Gypsum	Salinity	Sodium adsorption ratio
	In	meq/100 g	pH	Pct	Pct	mmhos/cm	
2420:							
Deroin, severely eroded	0-7	20-35	5.6-6.5	0	0	0	0
	7-12	15-25	6.1-7.8	0-5	0	0	0
	12-18	15-25	6.1-7.8	0-5	0	0	0
	18-40	15-25	6.1-7.8	0-5	0	0	0
	40-50	10-20	6.1-7.8	0-5	0	0	0
	50-80	10-20	6.1-7.8	0-5	0	0	0
2830:							
Filbert	0-5	18-27	4.5-6.0	0	0	0	0
	5-7	18-27	4.5-6.0	0	0	0	0
	7-12	12-18	5.1-6.5	0	0	0	0
	12-15	12-18	5.1-6.5	0	0	0	0
	15-25	26-37	6.1-7.8	0	0	0	0
	25-36	26-37	6.1-7.8	0	0	0	0
	36-43	26-37	6.1-7.8	0	0	0	0
	43-53	26-37	6.1-7.8	0	0	0	0
	53-62	26-37	6.1-7.8	0	0	0	0
	62-80	26-37	6.1-7.8	0	0	0	0
2844:							
Fillmore	0-7	15-22	5.1-6.5	0	0	0	0
	7-14	15-22	5.1-6.5	0	0	0	0
	14-22	12-18	5.1-6.5	0	0	0	0
	22-30	32-40	5.6-7.8	0	0	0	0
	30-42	32-40	5.6-7.8	0	0	0	0
	42-54	32-40	5.6-7.8	0	0	0	0
	54-62	32-40	5.6-7.8	0	0	0	0
	62-80	32-40	5.6-7.8	0	0	0	0
2863:							
Fluvaquents	0-20	25-50	6.6-8.4	0-5	0	0.0-2.0	0
	20-80	---	---	---	---	---	---
3025:							
Gibbon, occasionally flooded	0-5	16-22	7.4-8.4	0-5	0	0.0-2.0	0
	5-19	16-22	7.4-8.4	0-5	0	0.0-2.0	0
	19-24	16-22	7.4-8.4	0-5	0	0.0-2.0	0
	24-30	14-20	7.4-8.4	5-15	0	0.0-2.0	0-5
	30-42	14-20	7.9-8.4	5-15	0	0.0-2.0	0-5
	42-60	14-20	7.9-8.4	5-15	0	0.0-2.0	0-5
3038:							
Gibbon, occasionally flooded	0-5	16-22	7.4-8.4	0-5	0	0.0-2.0	0
	5-19	16-22	7.4-8.4	0-5	0	0.0-2.0	0
	19-24	16-22	7.4-8.4	0-5	0	0.0-2.0	0
	24-30	14-20	7.4-8.4	5-15	0	0.0-2.0	0-5
	30-42	14-20	7.9-8.4	5-15	0	0.0-2.0	0-5
	42-60	14-20	7.9-8.4	5-15	0	0.0-2.0	0-5
Saltine, occasionally flooded	0-7	12-25	7.4-9.6	1-10	0	0.0-8.0	0-50
	7-12	14-30	8.5-9.6	1-5	0	4.0-16.0	6-50
	12-30	14-30	8.5-9.6	1-5	0	4.0-16.0	6-50
	30-48	14-30	7.4-9.6	1-5	0	0.0-4.0	0-13
	48-55	14-30	7.4-9.6	1-5	0	0.0-4.0	0-13
	55-60	14-30	7.4-9.6	1-5	0	0.0-4.0	0-13

Table 19.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation exchange capacity	Soil reaction	Calcium carbonate	Gypsum	Salinity	Sodium adsorption ratio
	In	meq/100 g	pH	Pct	Pct	mmhos/cm	
3421:							
Hedville-------------	0-10	5.0-18	5.6-7.3	0	0	0	0
	10-16	5.0-15	5.6-7.3	0	0	0	0
	16-22	---	---	---	---	---	---
3830:							
Ida------------------	0-4	20-25	6.6-8.4	0-25	0	0	0
	4-8	20-25	7.4-8.4	5-30	0	0	0
	8-18	20-25	7.4-8.4	5-30	0	0	0
	18-40	20-25	7.4-8.4	5-30	0	0	0
	40-60	20-25	7.4-8.4	5-30	0	0	0
Steinauer------------	0-6	15-25	7.4-8.4	5-10	0	0	0
	6-15	15-25	7.9-8.4	5-15	0	0	0
	15-41	15-25	7.9-8.4	5-15	0	0	0
	41-60	15-25	7.9-8.4	5-15	0	0	0
3890:							
Inglewood, rarely flooded-------------	0-5	3.0-8.0	6.1 7.8	0	0	0	0
	5-22	1.0-8.0	6.1-7.8	0	0	0	0
	22-30	1.0-8.0	6.1-7.8	0	0	0	0
	30-40	1.0-8.0	6.1-7.8	0	0	0	0
	40-50	1.0-8.0	6.1-7.8	0	0	0	0
	50-80	1.0-8.0	6.1-7.8	0	0	0	0
4104:							
Judson---------------	0-6	22-28	5.6-7.3	0	0	0	0
	6-12	22-28	5.6-7.3	0	0	0	0
	12-22	22-28	5.6-7.3	0	0	0	0
	22-31	22-28	5.6-7.3	0	0	0	0
	31-43	22-28	5.6-7.3	0	0	0	0
	43-54	22-28	6.1-7.8	0	0	0	0
	54-69	22-28	6.1-7.8	0	0	0	0
	69-80	22-28	6.1-7.8	0	0	0	0
4106:							
Judson---------------	0-6	22-28	5.6-7.3	0	0	0	0
	6-12	22-28	5.6-7.3	0	0	0	0
	12-22	22-28	5.6-7.3	0	0	0	0
	22-31	22-28	5.6-7.3	0	0	0	0
	31-43	22-28	5.6-7.3	0	0	0	0
	43-54	22-28	6.1-7.8	0	0	0	0
	54-69	22-28	6.1-7.8	0	0	0	0
	69-80	22-28	6.1-7.8	0	0	0	0
4250:							
Kenridge, occasionally flooded	0-8	22-30	5.6-6.5	0	0	0	0
	8-20	22-30	5.6-6.5	0	0	0	0
	20-36	20-33	6.1-7.3	0	0	0	0
	36-46	20-33	6.1-7.3	0	0	0	0
	46-60	20-33	6.1-7.3	0	0	0	0
	60-80	19-27	6.1-7.3	0	0	0	0
4404:							
Lamo, occasionally flooded------------	0-5	18-28	7.4-8.4	1-10	0	0	0
	5-25	18-28	7.4-8.4	1-10	0	0	0
	25-36	18-28	7.4-8.4	1-10	0	0	0
	36-44	15-25	7.4-8.4	1-15	0	0	0
	44-60	15-25	7.4-8.4	1-15	0	0	0

Table 19.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation exchange capacity	Soil reaction	Calcium carbonate	Gypsum	Salinity	Sodium adsorption ratio
	In	meq/100 g	pH	Pct	Pct	mmhos/cm	
4583:							
Lex, occasionally flooded	0-7	11-22	7.4-8.4	1-10	0	0.0-2.0	0-2
	7-17	11-22	7.4-8.4	1-10	0	0.0-2.0	0-2
	17-19	11-22	7.4-8.4	1-10	0	0.0-2.0	0-2
	19-27	12-23	6.1-8.4	0-5	0	0.0-2.0	0-2
	27-60	2.0-5.0	6.1-7.8	0-5	0	0.0-2.0	0-2
4853:							
Malcolm	0-7	10-25	5.6-6.5	0	0	0	0
	7-12	15-30	5.6-6.5	0	0	0	0
	12-20	15-30	5.6-6.5	0	0	0	0
	20-28	15-30	5.6-6.5	0	0	0	0
	28-60	8.0-15	5.6-6.5	0	0	0	0
4860:							
Malmo, severely eroded	0-6	25-31	5.6-6.5	0	0	0	0
	6-15	30-36	6.1-7.8	0-5	0	0	0
	15-25	30-36	6.1-7.8	0-5	0	0	0
	25-39	30-36	6.1-7.8	0-5	0	0	0
	39-43	27-37	7.4-7.8	1-5	0	0	0
	43-54	13-33	7.4-8.4	1-10	0	0	0
	54-80	13-33	7.4-8.4	1-10	0	0	0
5388:							
Morrill	0-6	8.0-30	4.5-7.3	0	0	0	0
	6-12	10-30	5.1-7.3	0	0	0	0
	12-22	15-30	5.1-7.3	0	0	0	0
	22-30	15-30	5.1-7.3	0	0	0	0
	30-35	15-30	5.1-7.3	0	0	0	0
	35-43	15-30	5.1-7.3	0	0	0	0
	43-52	5.0-15	5.1-7.3	0	0	0	0
	52-59	4.0-25	5.1-7.3	0	0	0	0
	59-73	4.0-25	5.1-7.3	0	0	0	0
	73-80	4.0-25	5.1-7.3	0	0	0	0
5480:							
Muscotah, occasionally flooded	0-9	15-30	5.6-7.3	0	0	0	0
	9-16	15-30	5.6-7.3	0	0	0	0
	16-23	15-30	5.6-7.3	0	0	0	0
	23-35	20-40	5.6-7.3	0	0	0	0
	35-44	20-40	5.6-7.3	0	0	0	0
	44-60	20-40	5.6-7.3	0	0	0	0
	60-70	20-40	5.6-7.3	1-10	0	0	0
	70-80	20-40	5.6-7.3	0	0	0	0
5540:							
Nodaway, occasionally flooded	0-7	20-25	6.1-7.3	0	0	0.0-2.0	0
	7-14	20-25	6.1-7.3	0	0	0.0-2.0	0
	14-45	20-25	6.1-7.3	0	0	0.0-2.0	0
	45-60	20-25	6.1-7.3	0	0	0.0-2.0	0
5541:							
Nodaway, channeled	0-7	20-25	6.1-7.3	0	0	0.0-2.0	0
	7-14	20-25	6.1-7.3	0	0	0.0-2.0	0
	14-45	20-25	6.1-7.3	0	0	0.0-2.0	0
	45-60	20-25	6.1-7.3	0	0	0.0-2.0	0

Table 19.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation exchange capacity	Soil reaction	Calcium carbonate	Gypsum	Salinity	Sodium adsorption ratio
	In	meq/100 g	pH	Pct	Pct	mmhos/cm	
5736:							
Obert, frequently flooded	0-12	21-32	7.4-8.4	1-15	0	0.0-2.0	0
	12-24	13-25	7.4-8.4	0-15	0	0.0-2.0	0
	24-60	13-25	7.4-8.4	0-5	0	0.0-2.0	0
5742:							
Obert, occasionally flooded	0-12	21-32	7.4-8.4	1-15	0	0.0-2.0	0
	12-24	13-25	7.4-8.4	0-15	0	0.0-2.0	0
	24-60	13-25	7.4-8.4	0-5	0	0.0-2.0	0
5780:							
Olmitz	0-6	20-25	5.6-7.3	0	0	0	0
	6-22	20-25	5.6-7.3	0	0	0	0
	22-32	20-25	5.6-7.3	0	0	0	0
	32-40	20-25	5.6-7.3	0	0	0	0
	40-52	20-25	5.6-7.3	0	0	0	0
	52-60	20-25	5.6-7.3	0	0	0	0
6046:							
Pawnee	0-6	20-30	5.6-7.3	0	0	0	0
	6-10	25-30	5.6-7.3	0	0	0	0
	10-14	25-30	5.6-7.3	0	0	0	0
	14-24	30-40	6.1-7.8	0	0	0	0
	24-32	30-40	6.1-7.8	0	0	0	0
	32-45	30-40	6.1-7.8	0	0	0	0
	45-53	15-30	6.1-7.8	0-5	0	0	0
	53-80	20-25	7.4-8.4	1-10	0	0	0
6130:							
Platte, occasionally flooded	0-5	3.0-15	6.6-8.4	0-10	0	0.0-2.0	0
	5-8	3.0-15	6.6-8.4	0-10	0	0.0-2.0	0
	8-16	3.0-15	6.6-8.4	0-10	0	0.0-2.0	0
	16-80	0.0-5.0	6.6-7.8	0	0	0	0
6138:							
Platte, frequently flooded	0-5	3.0-15	6.6-8.4	0-10	0	0.0-2.0	0
	5-8	3.0-15	6.6-8.4	0-10	0	0.0-2.0	0
	8-16	3.0-15	6.6-8.4	0-10	0	0.0-2.0	0
	16-80	0.0-5.0	6.6-7.8	0	0	0	0
Barney, frequently flooded, channeled	0-7	11-22	6.6-8.4	0-5	0	0	0
	7-10	11-22	6.6-8.4	0-5	0	0	0
	10-30	0.0-4.0	6.6-7.8	0	0	0	0
	30-80	0.0-4.0	6.6-7.8	0	0	0	0
6160:							
Pohocco	0-6	20-35	6.6-7.8	0	0	0	0
	6-15	15-30	6.6-7.8	0	0	0	0
	15-20	15-30	6.6-7.8	1-5	0	0	0
	20-28	15-30	6.6-7.8	1-5	0	0	0
	28-80	15-20	7.4-8.4	1-10	0	0	0
6162:							
Pohocco	0-6	20-35	6.6-7.8	0	0	0	0
	6-15	15-30	6.6-7.8	0	0	0	0
	15-20	15-30	6.6-7.8	1-5	0	0	0
	20-28	15-30	6.6-7.8	1-5	0	0	0
	28-80	15-20	7.4-8.4	1-10	0	0	0

Table 19.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation exchange capacity	Soil reaction	Calcium carbonate	Gypsum	Salinity	Sodium adsorption ratio
	In	meq/100 g	pH	Pct	Pct	mmhos/cm	
6170:							
Pohocco----------------	0-6	20-35	6.6-7.8	0	0	0	0
	6-15	15-30	6.6-7.8	0	0	0	0
	15-20	15-30	6.6-7.8	1-5	0	0	0
	20-28	15-30	6.6-7.8	1-5	0	0	0
	28-80	15-20	7.4-8.4	1-10	0	0	0
Pahuk----------------	0-6	5.0-10	5.6-7.8	0	0	0	0
	6-14	0.0-10	5.6-7.8	0	0	0	0
	14-40	0.0-10	5.6-7.8	0	0	0	0
	40-80	0.0-10	5.6-7.8	0	0	0	0
6172:							
Pohocco----------------	0-6	20-35	6.6-7.8	0	0	0	0
	6-15	15-30	6.6-7.8	0	0	0	0
	15-20	15-30	6.6-7.8	1-5	0	0	0
	20-28	15-30	6.6-7.8	1-5	0	0	0
	28-80	15-20	7.4-8.4	1-10	0	0	0
Pahuk----------------	0-6	5.0-10	5.6-7.8	0	0	0	0
	6-14	0.0-10	5.6-7.8	0	0	0	0
	14-40	0.0-10	5.6-7.8	0	0	0	0
	40-80	0.0-10	5.6-7.8	0	0	0	0
6520:							
Saltillo,							
occasionally flooded	0-6	10-20	7.4-8.4	1-10	0	4.0-20.0	13-90
	6-17	14-30	7.4-9.0	1-5	0	4.0-20.0	13-90
	17-32	14-30	7.4-9.0	1-5	0	4.0-20.0	13-90
	32-50	14-30	7.4-9.0	1-5	0	4.0-20.0	13-90
	50-60	14-30	7.4-9.0	1-5	0	4.0-20.0	13-90
	60-80	14-30	7.4-9.0	1-5	0	4.0-20.0	13-90
6791:							
Scott----------------	0-6	20-30	5.1-6.5	0	0	0	0
	6-18	10-20	5.1-6.5	0	0	0	0
	18-28	20-35	5.6-7.8	0	0	0	0
	28-42	20-35	5.6-7.8	0	0	0	0
	42-56	20-35	5.6-7.8	0	0	0	0
	56-80	20-35	5.6-7.8	0	0	0	0
7069:							
Steinauer------------	0-6	15-25	7.4-8.4	5-10	0	0	0
	6-15	15-25	7.9-8.4	5-15	0	0	0
	15-41	15-25	7.9-8.4	5-15	0	0	0
	41-60	15-25	7.9-8.4	5-15	0	0	0
7290:							
Tomek----------------	0-11	15-25	6.1-7.3	0	0	0	0
	11-19	15-30	6.1-7.3	0	0	0	0
	19-54	25-30	6.6-7.8	0	0	0	0
	54-80	15-25	6.6-7.8	0	0	0	0
7920:							
Wann, occasionally							
flooded-------------	0-6	4.0-14	6.6-8.4	0-5	0	0.0-2.0	0-5
	6-16	4.0-14	6.6-8.4	0-5	0	0.0-2.0	0-5
	16-50	2.0-14	7.4-9.0	0-5	0	0.0-2.0	0-10
	50-60	2.0-16	7.4-9.0	0-5	0	0.0-2.0	0-10

Table 19.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation exchange capacity	Soil reaction	Calcium carbonate	Gypsum	Salinity	Sodium adsorption ratio
	In	meq/100 g	pH	Pct	Pct	mmhos/cm	
8120:							
Yutan----------------	0-6	25-35	5.1-6.5	0	0	0	0
	6-13	25-35	5.6-7.3	0	0	0	0
	13-20	20-30	6.1-7.3	0	0	0	0
	20-27	20-30	6.1-7.3	0	0	0	0
	27-32	20-30	6.1-7.3	0	0	0	0
	32-43	20-30	6.1-7.3	0	0	0	0
	43-63	15-25	6.6-7.8	0	0	0	0
	63-80	15-25	6.6-7.8	0	0	0	0
8124:							
Yutan----------------	0-6	25-35	5.1-6.5	0	0	0	0
	6-13	25-35	5.6-7.3	0	0	0	0
	13-20	20-30	6.1-7.3	0	0	0	0
	20-27	20-30	6.1-7.3	0	0	0	0
	27-32	20-30	6.1-7.3	0	0	0	0
	32-43	20-30	6.1-7.3	0	0	0	0
	43-63	15-25	6.6-7.8	0	0	0	0
	63-80	15-25	6.6-7.8	0	0	0	0
8130:							
Yutan----------------	0-6	25-35	5.1-6.5	0	0	0	0
	6-13	25-35	5.6-7.3	0	0	0	0
	13-20	20-30	6.1-7.3	0	0	0	0
	20-27	20-30	6.1-7.3	0	0	0	0
	27-32	20-30	6.1-7.3	0	0	0	0
	32-43	20-30	6.1-7.3	0	0	0	0
	43-63	15-25	6.6-7.8	0	0	0	0
	63-80	15-25	6.6-7.8	0	0	0	0
Aksarben-------------	0-6	25-35	5.1-6.5	0	0	0	0
	6-12	25-35	5.1-6.5	0	0	0	0
	12-18	25-35	5.1-6.5	0	0	0	0
	18-26	25-35	5.1-6.5	0	0	0	0
	26-34	25-35	5.1-6.5	0	0	0	0
	34-42	25-35	5.1-6.5	0	0	0	0
	42-60	25-35	5.6-6.5	0	0	0	0
	60-80	20-30	6.1-7.3	0	0	0	0
8134:							
Yutan----------------	0-6	25-35	5.1-6.5	0	0	0	0
	6-13	25-35	5.6-7.3	0	0	0	0
	13-20	20-30	6.1-7.3	0	0	0	0
	20-27	20-30	6.1-7.3	0	0	0	0
	27-32	20-30	6.1-7.3	0	0	0	0
	32-43	20-30	6.1-7.3	0	0	0	0
	43-63	15-25	6.6-7.8	0	0	0	0
	63-80	15-25	6.6-7.8	0	0	0	0
Judson---------------	0-6	22-28	5.6-7.3	0	0	0	0
	6-12	22-28	5.6-7.3	0	0	0	0
	12-22	22-28	5.6-7.3	0	0	0	0
	22-31	22-28	5.6-7.3	0	0	0	0
	31-43	22-28	5.6-7.3	0	0	0	0
	43-54	22-28	6.1-7.8	0	0	0	0
	54-69	22-28	6.1-7.8	0	0	0	0
	69-80	22-28	6.1-7.8	0	0	0	0

Table 19.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Cation exchange capacity	Soil reaction	Calcium carbonate	Gypsum	Salinity	Sodium adsorption ratio
	In	meq/100 g	pH	Pct	Pct	mmhos/cm	
9900:							
Arents, earthen dam.							
9985:							
Gravel pits----------	0-60	0.0-5.0	6.6-8.4	0	0	0	0
9998:							
Water.							

Table 20.--Soil Features

(See text for definitions of terms used in this table. Absence of an entry indicates that the feature is not a concern or that data were not estimated.)

Map symbol and soil name	Restrictive layer: Kind	Restrictive layer: Depth to top	Restrictive layer: Hardness	Potential for frost action	Risk of corrosion: Uncoated steel	Risk of corrosion: Concrete
		In				
1050:						
Aksarben	---	---	---	High	Moderate	Moderate
1100:						
Alda, occasionally flooded	---	---	---	High	Moderate	Low
1347:						
Barney, frequently flooded	---	---	---	Moderate	High	Low
1616:						
Boel, occasionally flooded	---	---	---	Moderate	High	Low
1873:						
Burchard	---	---	---	Moderate	Moderate	Low
Steinauer	---	---	---	Moderate	High	Low
1879:						
Burchard	---	---	---	Moderate	Moderate	Low
Steinauer	---	---	---	Moderate	High	Low
2420:						
Deroin, severely eroded	---	---	---	High	Moderate	Moderate
2830:						
Filbert	---	---	---	High	High	Low
2844:						
Fillmore	---	---	---	High	High	Low
2863:						
Fluvaquents	---	---	---	Moderate	High	Low
3025:						
Gibbon, occasionally flooded	---	---	---	High	High	Low
3038:						
Gibbon, occasionally flooded	---	---	---	High	High	Low
Saltine, occasionally flooded	---	---	---	High	High	High
3421:						
Hedville	Bedrock (lithic)	4-20	Strongly cemented	Moderate	Low	Moderate
3830:						
Ida	---	---	---	High	Low	Low
Steinauer	---	---	---	Moderate	High	Low
3890:						
Inglewood, rarely flooded	---	---	---	Moderate	Moderate	Low

Table 20.--Soil Features--Continued

Map symbol and soil name	Restrictive layer: Kind	Restrictive layer: Depth to top	Restrictive layer: Hardness	Potential for frost action	Risk of corrosion: Uncoated steel	Risk of corrosion: Concrete
		In				
4104:						
Judson	---	---	---	High	Moderate	Low
4106:						
Judson	---	---	---	High	Moderate	Low
4250:						
Kenridge, occasionally flooded	---	---	---	High	Moderate	Low
4404:						
Lamo, occasionally flooded	---	---	---	High	High	Low
4583:						
Lex, occasionally flooded	---	---	---	High	High	Low
4853:						
Malcolm	---	---	---	High	Moderate	Moderate
4860:						
Malmo, severely eroded	---	---	---	High	High	Low
5388:						
Morrill	---	---	---	Moderate	Moderate	Moderate
5480:						
Muscotah, occasionally flooded	---	---	---	Moderate	High	Low
5540:						
Nodaway, occasionally flooded	---	---	---	High	Moderate	Low
5541:						
Nodaway, channeled	---	---	---	High	Moderate	Low
5736:						
Obert, frequently flooded	---	---	---	High	High	Low
5742:						
Obert, occasionally flooded	---	---	---	High	High	Low
5780:						
Olmitz	---	---	---	Moderate	Moderate	Moderate
6046:						
Pawnee	---	---	---	High	High	Low
6130:						
Platte, occasionally flooded	---	---	---	Moderate	High	Moderate
6138:						
Platte, frequently flooded	---	---	---	Moderate	High	Moderate
Barney, frequently flooded, channeled	---	---	---	Moderate	High	Low

Table 20.--Soil Features--Continued

Map symbol and soil name	Restrictive layer: Kind	Restrictive layer: Depth to top	Restrictive layer: Hardness	Potential for frost action	Risk of corrosion: Uncoated steel	Risk of corrosion: Concrete
		In				
6160:						
Pohocco	---	---	---	High	Moderate	Low
6162:						
Pohocco	---	---	---	High	Moderate	Low
6170:						
Pohocco	---	---	---	High	Moderate	Low
Pahuk	---	---	---	Low	Low	Moderate
6172:						
Pohocco	---	---	---	High	Moderate	Low
Pahuk	---	---	---	Low	Low	Moderate
6520:						
Saltillo, occasionally flooded	---	---	---	High	High	High
6791:						
Scott	---	---	---	High	High	Low
7069:						
Steinauer	---	---	---	Moderate	High	Low
7290:						
Tomek	---	---	---	Moderate	Moderate	Low
7920:						
Wann, occasionally flooded	---	---	---	High	Moderate	Low
8120:						
Yutan	---	---	---	High	Moderate	Moderate
8124:						
Yutan	---	---	---	High	Moderate	Moderate
8130:						
Yutan	---	---	---	High	Moderate	Moderate
Aksarben	---	---	---	High	Moderate	Moderate
8134:						
Yutan	---	---	---	High	Moderate	Moderate
Judson	---	---	---	High	Moderate	Low
9900:						
Arents, earthen dam.						
9985:						
Gravel pits	---	---	---	Low	Low	Low
9998:						
Water.						

Table 21.--Water Features

(See text for definitions of terms used in this table. Estimates of the frequency of ponding and flooding apply to the whole year rather than to individual months. Absence of an entry indicates that the feature is not a concern or that data were not estimated.)

Map symbol and soil name	Hydro-logic group	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			Ft	Ft	Ft				
1050:									
Aksarben------------------	B								
		Jan-Dec	---	---	---	---	None	---	None
1100:									
Alda, occasionally flooded	C								
		January	1.5-3.0	>6.0	---	---	None	---	None
		February	1.5-3.0	>6.0	---	---	None	---	None
		March	1.5-3.0	>6.0	---	---	None	---	None
		April	1.5-3.0	>6.0	---	---	None	Brief	Occasional
		May	1.5-3.0	>6.0	---	---	None	Brief	Occasional
		June	---	---	---	---	None	Brief	Occasional
		July	---	---	---	---	None	Brief	Occasional
		November	1.5-3.0	>6.0	---	---	None	---	None
		December	1.5-3.0	>6.0	---	---	None	---	None
1347:									
Barney, frequently flooded	D								
		January	0.0-2.0	>6.0	---	---	None	---	None
		February	0.0-2.0	>6.0	---	---	None	---	None
		March	0.0-2.0	>6.0	---	---	None	Brief	Frequent
		April	0.0-2.0	>6.0	---	---	None	Brief	Frequent
		May	0.0-2.0	>6.0	---	---	None	Brief	Frequent
		June	0.0-2.0	>6.0	---	---	None	Brief	Frequent
		July	---	---	---	---	None	Brief	Occasional
		November	0.0-2.0	>6.0	---	---	None	---	None
		December	0.0-2.0	>6.0	---	---	None	---	None
1616:									
Boel, occasionally flooded	A								
		January	1.5-3.0	>6.0	---	---	None	---	None
		February	1.5-3.0	>6.0	---	---	None	---	None
		March	1.5-3.0	>6.0	---	---	None	Brief	Occasional
		April	1.5-3.0	>6.0	---	---	None	Brief	Occasional
		May	1.5-3.0	>6.0	---	---	None	Brief	Occasional
		June	---	---	---	---	None	Brief	Occasional
		November	1.5-3.0	>6.0	---	---	None	---	None
		December	1.5-3.0	>6.0	---	---	None	---	None
1873:									
Burchard------------------	B								
		Jan-Dec	---	---	---	---	None	---	None
Steinauer-----------------	B								
		Jan-Dec	---	---	---	---	None	---	None
1879:									
Burchard------------------	B								
		Jan-Dec	---	---	---	---	None	---	None
Steinauer-----------------	B								
		Jan-Dec	---	---	---	---	None	---	None
2420:									
Deroin, severely eroded---	B								
		Jan-Dec	---	---	---	---	None	---	None

Table 21.--Water Features--Continued

Map symbol and soil name	Hydro-logic group	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			Ft	Ft	Ft				
2830:									
Filbert	D								
		March	0.5-1.5	0.8-2.0	---	---	None	---	None
		April	0.5-1.5	0.8-2.0	---	---	None	---	None
		May	0.5-1.5	0.8-2.0	---	---	None	---	None
		June	0.5-1.5	0.8-2.0	---	---	None	---	None
		July	0.5-1.5	0.8-2.0	---	---	None	---	None
2844:									
Fillmore	D								
		March	0.0-2.0	1.0-3.0	0.0-0.5	Brief	Occasional	---	None
		April	0.0-2.0	1.0-3.0	0.0-0.5	Brief	Occasional	---	None
		May	0.0-2.0	1.0-3.0	0.0-0.5	Brief	Occasional	---	None
		June	0.0-2.0	1.0-3.0	0.0-0.5	Brief	Occasional	---	None
		July	0.0-2.0	1.0-3.0	0.0-0.5	Brief	Occasional	---	None
2863:									
Fluvaquents	D								
		January	0.0	>6.0	0.0-2.0	Very long	Frequent	Brief	Frequent
		February	0.0	>6.0	0.0-2.0	Very long	Frequent	Brief	Frequent
		March	0.0	>6.0	0.0-2.0	Very long	Frequent	Brief	Frequent
		April	0.0	>6.0	0.0-2.0	Very long	Frequent	Brief	Frequent
		May	0.0	>6.0	0.0-2.0	Very long	Frequent	Brief	Frequent
		June	0.0	>6.0	0.0-2.0	Very long	Frequent	Brief	Frequent
		July	0.0	>6.0	0.0-2.0	Very long	Frequent	Brief	Occasional
		August	0.0	>6.0	0.0-2.0	Very long	Frequent	Brief	Occasional
		September	0.0	>6.0	0.0-2.0	Very long	Frequent	Brief	Occasional
		October	0.0	>6.0	0.0-2.0	Very long	Frequent	Brief	Occasional
		November	0.0	>6.0	0.0-2.0	Very long	Frequent	Brief	Frequent
		December	0.0	>6.0	0.0-2.0	Very long	Frequent	Brief	Frequent
3025:									
Gibbon, occasionally flooded	B								
		January	1.5-3.0	>6.0	---	---	None	---	None
		February	1.5-3.0	>6.0	---	---	None	---	None
		March	1.5-3.0	>6.0	---	---	None	Very brief	Occasional
		April	1.5-3.0	>6.0	---	---	None	Very brief	Occasional
		May	1.5-3.0	>6.0	---	---	None	Very brief	Occasional
		June	1.5-3.0	>6.0	---	---	None	Very brief	Occasional
		July	---	---	---	---	None	Very brief	Occasional
		November	1.5-3.0	>6.0	---	---	None	---	None
		December	1.5-3.0	>6.0	---	---	None	---	None
3038:									
Gibbon, occasionally flooded	B								
		January	1.5-3.0	>6.0	---	---	None	---	None
		February	1.5-3.0	>6.0	---	---	None	---	None
		March	1.5-3.0	>6.0	---	---	None	Very brief	Occasional
		April	1.5-3.0	>6.0	---	---	None	Very brief	Occasional
		May	1.5-3.0	>6.0	---	---	None	Very brief	Occasional
		June	1.5-3.0	>6.0	---	---	None	Very brief	Occasional
		July	---	---	---	---	None	Very brief	Occasional
		November	1.5-3.0	>6.0	---	---	None	---	None
		December	1.5-3.0	>6.0	---	---	None	---	None

Table 21.--Water Features--Continued

Map symbol and soil name	Hydro-logic group	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			Ft	Ft	Ft				
3038:									
Saltine, occasionally flooded	C								
		January	1.5-3.0	>6.0	---	---	None	---	None
		February	1.5-3.0	>6.0	---	---	None	---	None
		March	1.5-3.0	>6.0	---	---	None	---	None
		April	1.5-3.0	>6.0	---	---	None	Brief	Occasional
		May	1.5-3.0	>6.0	---	---	None	Brief	Occasional
		June	1.5-3.0	>6.0	---	---	None	Brief	Occasional
		July	1.5-3.0	>6.0	---	---	None	Brief	Occasional
		November	1.5-3.0	>6.0	---	---	None	---	None
		December	1.5-3.0	>6.0	---	---	None	---	None
3421:									
Hedville	D								
		Jan-Dec	---	---	---	---	None	---	None
3830:									
Ida	B								
		Jan-Dec	---	---	---	---	None	---	None
Steinauer	B								
		Jan-Dec	---	---	---	---	None	---	None
3890:									
Inglewood, rarely flooded	A								
		January	3.0-6.0	>6.0	---	---	None	---	None
		February	3.0-6.0	>6.0	---	---	None	Brief	Rare
		March	3.0-6.0	>6.0	---	---	None	Brief	Rare
		April	3.0-6.0	>6.0	---	---	None	Brief	Rare
		May	3.0-6.0	>6.0	---	---	None	Brief	Rare
		June	3.0-6.0	>6.0	---	---	None	Brief	Rare
		July	3.0-6.0	>6.0	---	---	None	---	None
		November	3.0-6.0	>6.0	---	---	None	---	None
		December	3.0-6.0	>6.0	---	---	None	---	None
4104:									
Judson	B								
		Jan-Dec	---	---	---	---	None	---	None
4106:									
Judson	B								
		Jan-Dec	---	---	---	---	None	---	None
4250:									
Kenridge, occasionally flooded	C								
		January	3.0-6.0	>6.0	---	---	None	---	None
		February	3.0-6.0	>6.0	---	---	None	---	None
		March	3.0-6.0	>6.0	---	---	None	Brief	Occasional
		April	3.0-6.0	>6.0	---	---	None	Brief	Occasional
		May	3.0-6.0	>6.0	---	---	None	Brief	Occasional
		June	3.0-6.0	>6.0	---	---	None	Brief	Occasional
		July	3.0-6.0	>6.0	---	---	None	Brief	Occasional
		August	---	---	---	---	None	Brief	Occasional
		September	---	---	---	---	None	Brief	Occasional
		October	---	---	---	---	None	Brief	Occasional
		November	3.0-6.0	>6.0	---	---	None	---	None
		December	3.0-6.0	>6.0	---	---	None	---	None

Table 21.--Water Features--Continued

Map symbol and soil name	Hydro-logic group	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			Ft	Ft	Ft				
4404:									
Lamo, occasionally flooded	C								
		January	1.0-3.0	>6.0	---	---	None	---	None
		February	1.0-3.0	>6.0	---	---	None	---	None
		March	1.0-3.0	>6.0	---	---	None	Brief	Occasional
		April	1.0-3.0	>6.0	---	---	None	Brief	Occasional
		May	1.0-3.0	>6.0	---	---	None	Brief	Occasional
		June	---	---	---	---	None	Brief	Occasional
		July	---	---	---	---	None	Brief	Occasional
		August	---	---	---	---	None	Brief	Occasional
		November	1.0-3.0	>6.0	---	---	None	---	None
		December	1.0-3.0	>6.0	---	---	None	---	None
4583:									
Lex, occasionally flooded-	B								
		January	1.0-3.0	>6.0	---	---	None	---	None
		February	1.0-3.0	>6.0	---	---	None	---	None
		March	1.0-3.0	>6.0	---	---	None	---	None
		April	1.0-3.0	>6.0	---	---	None	Brief	Occasional
		May	1.0-3.0	>6.0	---	---	None	Brief	Occasional
		June	---	---	---	---	None	Brief	Occasional
		July	---	---	---	---	None	Brief	Occasional
		November	1.0-3.0	>6.0	---	---	None	---	None
		December	1.0-3.0	>6.0	---	---	None	---	None
4853:									
Malcolm-------------------	B								
		Jan-Dec	---	---	---	---	None	---	None
4860:									
Malmo, severely eroded----	D								
		March	1.0-3.0	1.5-3.0	---	---	None	---	None
		April	1.0-3.0	1.5-3.0	---	---	None	---	None
		May	1.0-3.0	1.5-3.0	---	---	None	---	None
		June	1.0-3.0	1.5-3.0	---	---	None	---	None
5388:									
Morrill-------------------	B								
		Jan-Dec	---	---	---	---	None	---	None
5480:									
Muscotah, occasionally flooded------------------	D								
		March	1.5-3.0	>6.0	---	---	None	Brief	Occasional
		April	1.5-3.0	>6.0	---	---	None	Brief	Occasional
		May	1.5-3.0	>6.0	---	---	None	Brief	Occasional
		June	1.5-3.0	>6.0	---	---	None	Brief	Occasional
5540:									
Nodaway, occasionally flooded------------------	B								
		February	---	---	---	---	None	Brief	Occasional
		March	---	---	---	---	None	Brief	Occasional
		April	3.0-5.0	>6.0	---	---	None	Brief	Occasional
		May	3.0-5.0	>6.0	---	---	None	Brief	Occasional
		June	3.0-5.0	>6.0	---	---	None	Brief	Occasional
		July	3.0-5.0	>6.0	---	---	None	Brief	Occasional
		August	---	---	---	---	None	Brief	Occasional
		September	---	---	---	---	None	Brief	Occasional
		October	---	---	---	---	None	Brief	Occasional
		November	---	---	---	---	None	Brief	Occasional

Table 21.--Water Features--Continued

Map symbol and soil name	Hydro-logic group	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			Ft	Ft	Ft				
5541:									
Nodaway, channeled	B								
		February	---	---	---	---	None	Brief	Frequent
		March	---	---	---	---	None	Brief	Frequent
		April	3.0-5.0	>6.0	---	---	None	Brief	Frequent
		May	3.0-5.0	>6.0	---	---	None	Brief	Frequent
		June	3.0-5.0	>6.0	---	---	None	Brief	Frequent
		July	3.0-5.0	>6.0	---	---	None	Brief	Frequent
		August	---	---	---	---	None	Brief	Frequent
		September	---	---	---	---	None	Brief	Frequent
		October	---	---	---	---	None	Brief	Frequent
		November	---	---	---	---	None	Brief	Frequent
5736:									
Obert, frequently flooded	D								
		January	0.0-1.5	>6.0	0.0-0.5	Long	Occasional	---	None
		February	0.0-1.5	>6.0	0.0-0.5	Long	Occasional	---	None
		March	0.0-1.5	>6.0	0.0-0.5	Long	Occasional	Brief	Frequent
		April	0.0-1.5	>6.0	0.0-0.5	Long	Occasional	Brief	Frequent
		May	0.0-1.5	>6.0	0.0-0.5	Long	Occasional	Brief	Frequent
		June	0.0-1.5	>6.0	0.0-0.5	Long	Occasional	Brief	Frequent
		July	1.5-3.0	>6.0	---	---	None	Brief	Frequent
		August	1.5-3.0	>6.0	---	---	None	Brief	Frequent
		September	1.5-3.0	>6.0	---	---	None	Brief	Frequent
		October	1.5-3.0	>6.0	---	---	None	Brief	Frequent
		November	0.0-1.5	>6.0	0.0-0.5	Long	Occasional	---	None
		December	0.0-1.5	>6.0	0.0-0.5	Long	Occasional	---	None
5742:									
Obert, occasionally flooded	D								
		January	0.0-1.5	>6.0	---	---	None	---	None
		February	0.0-1.5	>6.0	---	---	None	---	None
		March	0.0-1.5	>6.0	---	---	None	Brief	Occasional
		April	0.0-1.5	>6.0	---	---	None	Brief	Occasional
		May	0.0-1.5	>6.0	---	---	None	Brief	Occasional
		June	0.0-1.5	>6.0	---	---	None	Brief	Occasional
		July	1.5-3.0	>6.0	---	---	None	Brief	Occasional
		August	1.5-3.0	>6.0	---	---	None	Brief	Occasional
		September	1.5-3.0	>6.0	---	---	None	Brief	Occasional
		October	1.5-3.0	>6.0	---	---	None	Brief	Occasional
		November	0.0-1.5	>6.0	---	---	None	---	None
		December	0.0-1.5	>6.0	---	---	None	---	None
5780:									
Olmitz	B								
		Jan-Dec	---	---	---	---	None	---	None
6046:									
Pawnee	D								
		March	1.0-3.0	1.5-3.0	---	---	None	---	None
		April	1.0-3.0	1.5-3.0	---	---	None	---	None
		May	1.0-3.0	1.5-3.0	---	---	None	---	None

Table 21.--Water Features--Continued

Map symbol and soil name	Hydro-logic group	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			Ft	Ft	Ft				
6130:									
Platte, occasionally flooded	B								
		February	1.0-3.0	>6.0	---	---	None	---	None
		March	1.0-3.0	>6.0	---	---	None	Brief	Occasional
		April	1.0-3.0	>6.0	---	---	None	Brief	Occasional
		May	1.0-3.0	>6.0	---	---	None	Brief	Occasional
		June	1.0-3.0	>6.0	---	---	None	Brief	Occasional
		July	---	---	---	---	None	Brief	Occasional
		August	---	---	---	---	None	Brief	Occasional
		September	---	---	---	---	None	Brief	Occasional
		October	---	---	---	---	None	Brief	Occasional
6138:									
Platte, frequently flooded	B								
		February	1.0-3.0	>6.0	---	---	None	---	None
		March	1.0-3.0	>6.0	---	---	None	Brief	Frequent
		April	1.0-3.0	>6.0	---	---	None	Brief	Frequent
		May	1.0-3.0	>6.0	---	---	None	Brief	Frequent
		June	1.0-3.0	>6.0	---	---	None	Brief	Frequent
		July	---	---	---	---	None	Brief	Frequent
		August	---	---	---	---	None	Brief	Frequent
		September	---	---	---	---	None	Brief	Frequent
		October	---	---	---	---	None	Brief	Frequent
Barney, frequently flooded, channeled	D								
		January	0.0-2.0	>6.0	---	---	None	---	None
		February	0.0-2.0	>6.0	---	---	None	---	None
		March	0.0-2.0	>6.0	---	---	None	Brief	Frequent
		April	0.0-2.0	>6.0	---	---	None	Brief	Frequent
		May	0.0-2.0	>6.0	---	---	None	Brief	Frequent
		June	0.0-2.0	>6.0	---	---	None	Brief	Frequent
		July	---	---	---	---	None	Brief	Occasional
		November	0.0-2.0	>6.0	---	---	None	---	None
		December	0.0-2.0	>6.0	---	---	None	---	None
6160:									
Pohocco	B								
		Jan-Dec	---	---	---	---	None	---	None
6162:									
Pohocco	B								
		Jan-Dec	---	---	---	---	None	---	None
6170:									
Pohocco	B								
		Jan-Dec	---	---	---	---	None	---	None
Pahuk	A								
		Jan-Dec	---	---	---	---	None	---	None
6172:									
Pohocco	B								
		Jan-Dec	---	---	---	---	None	---	None
Pahuk	A								
		Jan-Dec	---	---	---	---	None	---	None

Table 21.--Water Features--Continued

Map symbol and soil name	Hydro-logic group	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			Ft	Ft	Ft				
6520: Saltillo, occasionally flooded	C								
		January	0.0-1.5	>6.0	---	---	None	---	None
		February	0.0-1.5	>6.0	---	---	None	---	None
		March	0.0-1.5	>6.0	---	---	None	---	None
		April	0.0-1.5	>6.0	---	---	None	Brief	Occasional
		May	0.0-1.5	>6.0	---	---	None	Brief	Occasional
		June	0.0-1.5	>6.0	---	---	None	Brief	Occasional
		July	0.0-1.5	>6.0	---	---	None	Brief	Occasional
		November	0.0-1.5	>6.0	---	---	None	---	None
		December	0.0-1.5	>6.0	---	---	None	---	None
6791: Scott	D								
		March	0.0-2.0	1.0-3.0	0.0-2.0	Very long	Frequent	---	None
		April	0.0-2.0	1.0-3.0	0.0-2.0	Very long	Frequent	---	None
		May	0.0-2.0	1.0-3.0	0.0-2.0	Very long	Frequent	---	None
		June	0.0-2.0	1.0-3.0	0.0-2.0	Very long	Frequent	---	None
		July	0.0-2.0	1.0-3.0	0.0-2.0	Very long	Frequent	---	None
7069: Steinauer	B								
		Jan-Dec	---	---	---	---	None	---	None
7290: Tomek	B								
		Jan-Dec	---	---	---	---	None	---	None
7920: Wann, occasionally flooded	B								
		March	1.5-3.5	>6.0	---	---	None	Brief	Occasional
		April	1.5-3.5	>6.0	---	---	None	Brief	Occasional
		May	1.5-3.5	>6.0	---	---	None	Brief	Occasional
		June	1.5-3.5	>6.0	---	---	None	Brief	Occasional
		July	1.5-3.5	>6.0	---	---	None	Brief	Occasional
		August	---	---	---	---	None	Brief	Occasional
		September	---	---	---	---	None	Brief	Occasional
		October	---	---	---	---	None	Brief	Occasional
		November	---	---	---	---	None	Brief	Occasional
8120: Yutan	B								
		Jan-Dec	---	---	---	---	None	---	None
8124: Yutan	B								
		Jan-Dec	---	---	---	---	None	---	None
8130: Yutan	B								
		Jan-Dec	---	---	---	---	None	---	None
Aksarben	B								
		Jan-Dec	---	---	---	---	None	---	None
8134: Yutan	B								
		Jan-Dec	---	---	---	---	None	---	None
Judson	B								
		Jan-Dec	---	---	---	---	None	---	None

Table 21.--Water Features--Continued

Map symbol and soil name	Hydro-logic group	Month	Water table: Upper limit	Water table: Lower limit	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			Ft	Ft	Ft				
9900:									
Arents, earthen dam.									
9985:									
Gravel pits	A								
		Jan-Dec	---	---	---	---	None	---	None
9998:									
Water.									

Table 22.--Classification of the Soils

Soil name	Family or higher taxonomic class
Aksarben	Fine, smectitic, mesic Typic Argiudolls
Alda	Coarse-loamy, mixed, superactive, mesic Oxyaquic Haplustolls
Barney	Sandy, mixed, mesic Mollic Fluvaquents
Boel	Sandy, mixed, mesic Fluvaquentic Haplustolls
Burchard	Fine-loamy, mixed, superactive, mesic Typic Argiudolls
Deroin	Fine-silty, mixed, superactive, mesic Mollic Hapludalfs
Filbert	Fine, smectitic, mesic Vertic Argialbolls
Fillmore	Fine, smectitic, mesic Vertic Argialbolls
Fluvaquents	Mesic Fluvaquents
Gibbon	Fine-silty, mixed, superactive, calcareous, mesic Fluvaquentic Endoaquolls
Hedville	Loamy, mixed, superactive, mesic Lithic Haplustolls
Ida	Fine-silty, mixed, superactive, calcareous, mesic Typic Udorthents
Inglewood	Sandy, mixed, mesic Oxyaquic Udifluvents
Judson	Fine-silty, mixed, superactive, mesic Cumulic Hapludolls
Kenridge	Fine-silty, mixed, superactive, mesic Cumulic Hapludolls
Lamo	Fine-silty, mixed, superactive, calcareous, mesic Cumulic Endoaquolls
Lex	Fine-loamy over sandy or sandy-skeletal, mixed, superactive, calcareous, mesic Fluvaquentic Endoaquolls
Malcolm	Fine-silty, mixed, superactive, mesic Typic Argiudolls
Malmo	Fine, smectitic, mesic Aquertic Hapludalfs
Morrill	Fine-loamy, mixed, superactive, mesic Typic Argiudolls
Muscotah	Fine, smectitic, mesic Cumulic Hapludolls
Nodaway	Fine-silty, mixed, superactive, nonacid, mesic Mollic Udifluvents
Obert	Fine-silty, mixed, superactive, calcareous, mesic Cumulic Endoaquolls
Olmitz	Fine-loamy, mixed, superactive, mesic Cumulic Hapludolls
Pahuk	Mixed, mesic Typic Udipsamments
Pawnee	Fine, smectitic, mesic Oxyaquic Vertic Argiudolls
Platte	Sandy, mixed, mesic Aeric Fluvaquents
Pohocco	Fine-silty, mixed, superactive, mesic Typic Eutrudepts
Saltillo	Fine-silty, mixed, superactive, calcareous, mesic Typic Halaquepts
Saltine	Fine-silty, mixed, superactive, calcareous, mesic Typic Halaquepts
Scott	Fine, smectitic, mesic Vertic Argialbolls
Steinauer	Fine-loamy, mixed, superactive, calcareous, mesic Typic Udorthents
Tomek	Fine, smectitic, mesic Pachic Argiudolls
Wann	Coarse-loamy, mixed, superactive, mesic Fluvaquentic Haplustolls
Yutan	Fine-silty, mixed, superactive, mesic Mollic Hapludalfs

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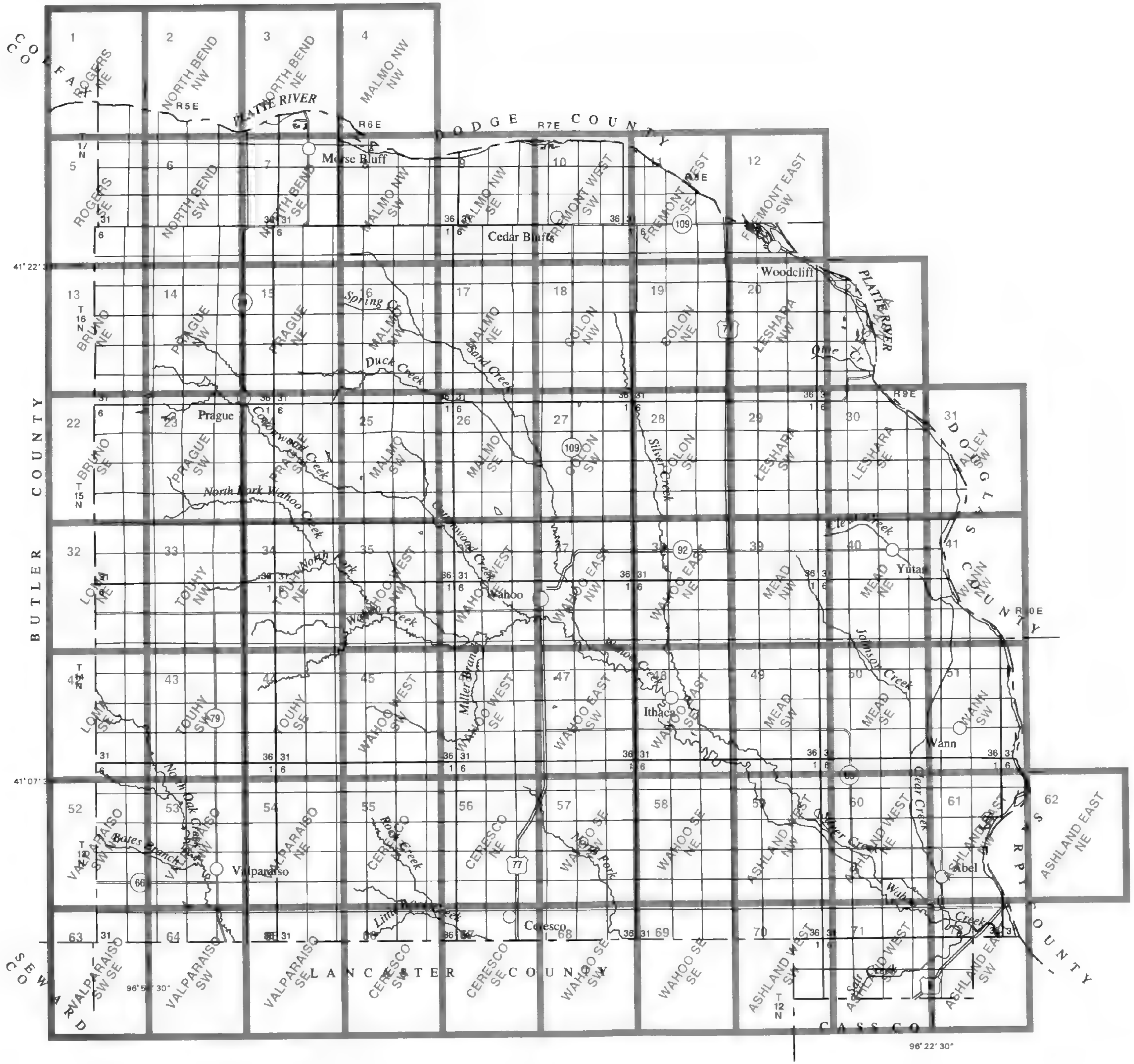


SECTIONALIZED TOWNSHIP

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

INDEX TO MAP SHEETS
SAUNDERS COUNTY, NEBRASKA

Scale 1:253440

1 0 1 2 3
MILES

1 0 1 2 3 4 5 6
KILOMETERS

SOIL LEGEND

SYMBOL	NAME
1050	Aksarben silty clay loam, 0 to 2 percent slopes
1100	Alda fine sandy loam, occasionally flooded
1347	Barney silty clay loam, wet, frequently flooded
1616	Boel loamy fine sand, occasionally flooded
1873	Burchard-Steinauer clay loams, 6 to 12 percent slopes, eroded
1879	Burchard-Steinauer clay loams, 12 to 18 percent slopes, eroded
2420	Deroin silty clay loam, 5 to 11 percent slopes, eroded
2830	Filbert silt loam, 0 to 1 percent slopes
2844	Fillmore silt loam, terrace, occasionally ponded
2863	Fluvaquents, silty, frequently flooded
3025	Gibbon silt loam, occasionally flooded
3038	Gibbon-Saltine loams, occasionally flooded
3421	Hedville cobbly loam, 6 to 30 percent slopes
3830	Ida-Steinauer complex, 17 to 60 percent slopes
3890	Inglewood loamy fine sand, rarely flooded
4104	Judson silt loam, 0 to 2 percent slopes
4106	Judson silt loam, 2 to 5 percent slopes
4250	Kenridge silty clay loam, occasionally flooded
4404	Lamo silty clay loam, occasionally flooded
4583	Lex loam, occasionally flooded
4853	Malcolm silt loam, 5 to 11 percent slopes, moderately eroded
4860	Malmo clay loam, 6 to 12 percent slopes, eroded
5388	Morrill clay loam, 6 to 12 percent slopes, moderately eroded
5480	Muscotah silty clay loam, occasionally flooded
5540	Nodaway silt loam, occasionally flooded
5541	Nodaway silt loam, channeled, frequently flooded
5736	Obert silty clay loam, wet, frequently flooded
5742	Obert silty clay loam, occasionally flooded
5780	Olmitz loam, 2 to 5 percent slopes
6046	Pawnee clay loam, 6 to 12 percent slopes, moderately eroded
6130	Platte fine sandy loam, occasionally flooded
6138	Platte Barney complex, channeled, frequently flooded
6160	Pohocco silty clay loam, 5 to 11 percent slopes, eroded
6162	Pohocco silty clay loam 11 to 17 percent slopes, eroded
6170	Pohocco-Pahuk complex, 5 to 11 percent slopes, eroded
6172	Pohocco-Pahuk complex, 11 to 17 percent slopes, eroded
6520	Saltillo silt loam, occasionally flooded
6791	Scott silt loam, terrace, frequently ponded
7069	Steinauer clay loam, 12 to 30 percent slopes
7290	Tomek silt loam, 0 to 2 percent slopes
7920	Wann fine sandy loam, occasionally flooded
8120	Yutan silty clay loam, 11 to 17 percent slopes, eroded
8124	Yutan silty clay loam, terrace, 2 to 5 percent slopes, eroded
8130	Yutan, eroded-Aksarben silty clay loams, 2 to 5 percent slopes
8134	Yutan, eroded-Judson complex, 5 to 11 percent slopes
9900	Arents, earthen dam
9985	Gravel pits
9998	Water

CONVENTIONAL AND SPECIAL SYMBOLS LEGEND

CULTURAL FEATURES

BOUNDARIES

- National, state, or province
- County or parish
- Minor civil division
- Reservation (national forest or park, state forest or park, and large airport)
- Land grant
- Limit of soil survey (label)
- Field sheet matchline and neatline

AD HOC BOUNDARY (label)

- Small airport, airfield, park, oilfield, cemetery, or flood pool

STATE COORDINATE TICK
1 890 000 FEET

LAND DIVISION CORNER (sections and land grants)

ROADS

- Divided (median shown if scale permits)
- Other roads
- Trail

ROAD EMBLEM & DESIGNATIONS

- Interstate — 173
- Federal — 287
- State — 52
- County, farm or ranch — 1283

RAILROAD

POWER TRANSMISSION LINE (normally not shown)

PIPE LINE (normally not shown)

FENCE (normally not shown)

LEVEES

- Without road
- With road
- With railroad

DAMS

- Medium or Small (Named where applicable) — W

PITS

- Gravel pit
- Mine or quarry

MISCELLANEOUS CULTURAL FEATURES

- Farmstead, house (omit in urban area) (occupied)
- Church
- School
- Indian mound (label)
- Located object (label) — Tower
- Tank (label) — Gas
- Wells, oil or gas
- Windmill
- Kitchen midden

SPECIAL SYMBOLS FOR SOIL SURVEY

SOIL DELINEATIONS AND SYMBOLS — 2830 8124

SHORT STEEP SLOPE

DEPRESSION OR SINK

MISCELLANEOUS

- Gravelly spot
- Gumbo, slick or scabby spot (sodic)
- Dumps and other similar non soil areas
- Rock outcrop (includes sandstone and shale)
- Saline spot
- Sandy spot
- Severely eroded spot
- Grayish silt and fine sand spot
- Glacial till spot

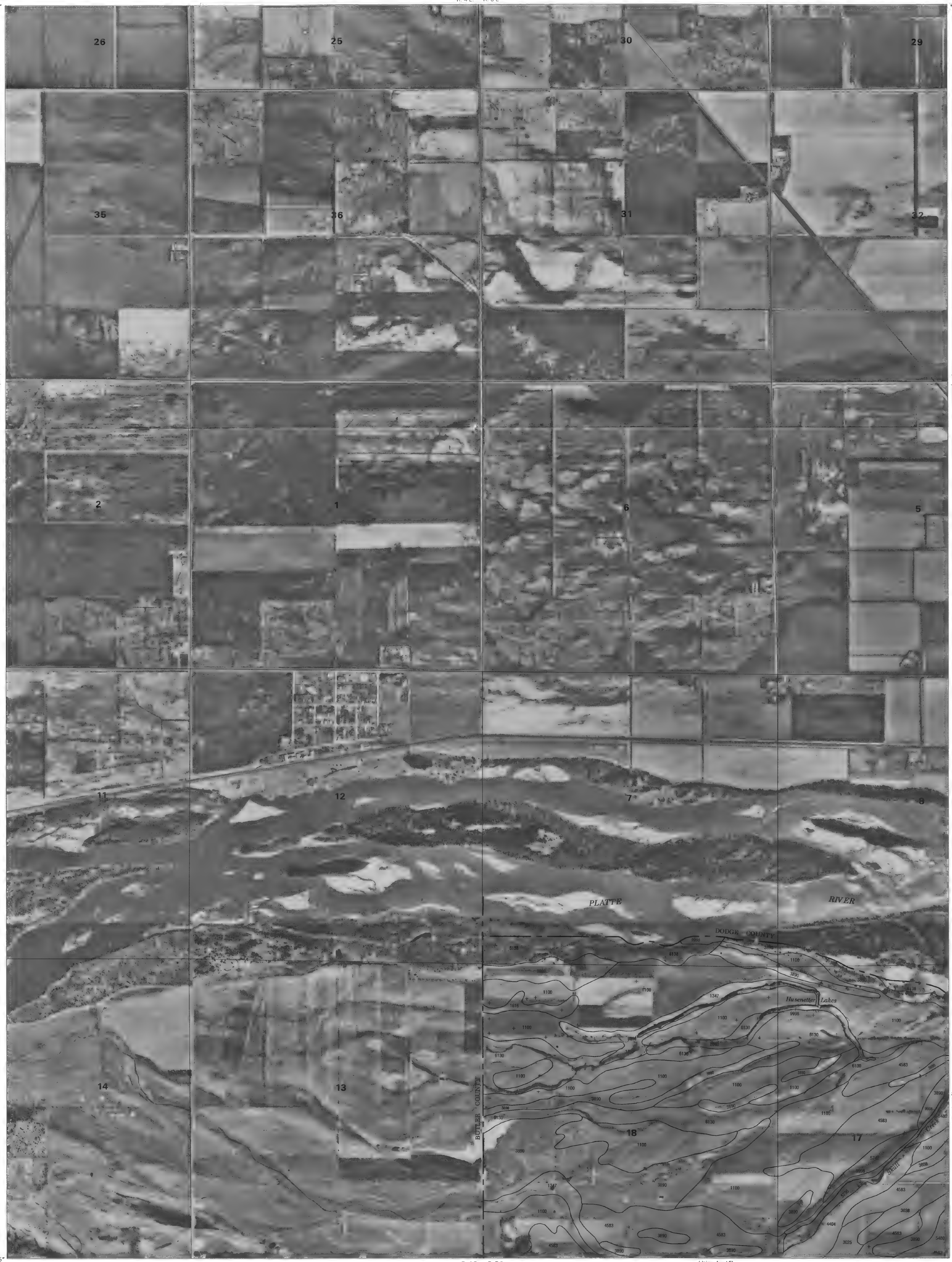
UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

96°56'15"
41°30'00"

R. 4 E. R. 5 E.

96°52'30"
41°30'00"

T. 18 N.
T. 17 N.



41°26'15"
96°56'15"

R. 4 E. R. 5 E.

(Joins sheet 5)

41°26'15"
96°52'30"

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North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUARTER QUADRANGLE LOCATION

SCALE 1:12000

0.5 0 0.5
MILES

500 0 500 1000 1500 2000 2500 3000 3500
FEET

0.5 0 0.5
KILOMETERS

1	2	3
4		5
6	7	8

1 DODGE SW SW
2 DODGE SW SE
3 WEBSTER SW
4 ROGERS NW
5 NORTH BEND NW
6 ROGERS SW
7 ROGERS SE
8 NORTH BEND SW

INDEX TO ADJOINING 3.75 MAPS

ROGERS NE, NEBRASKA
3.75 MINUTE SERIES
SHEET NUMBER 1 OF 72

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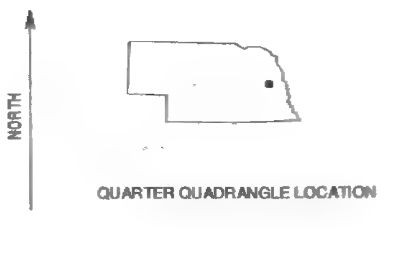

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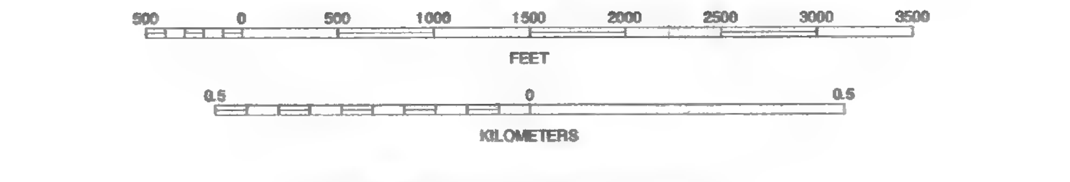
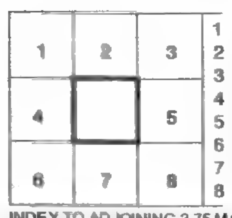




1 DODGE SW SE
2 WEBSTER SW
3 WEBSTER SE
4 ROGERS NE
5 NORTH BEND NE
6 ROGERS SE
7 NORTH BEND SW
8 NORTH BEND SE

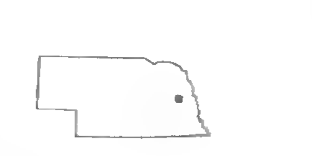
INDEX TO ADJOINING 3.75 MAPS

NORTH BEND NW, NEBRASKA
3.75 MINUTE SERIES
SHEET NUMBER 2 OF 72

This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service, formerly Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 1992-1994 aerial photography.

North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



QUARTER QUADRANGLE LOCATION

SCALE 1:12000

0.5 0 0.5
MILES

500 0 500 1000 1500 2000 2500 3000 3500
FEET

0.5 0 0.5
KILOMETERS

1	2	3
4		5
6	7	8

1 WEBSTER SW
2 WEBSTER SE
3 SCRIBNER SW SW
4 NORTH BEND NW
5 MALMO NW NW
6 NORTH BEND SW
7 NORTH BEND SE
8 MALMO NW SW

INDEX TO ADJOINING 3.75 MAPS

NORTH BEND NE, NEBRASKA
3.75 MINUTE SERIES
SHEET NUMBER 3 OF 72

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

SAUNDERS COUNTY, NEBRASKA
MALMO NW NW QUADRANGLE
SHEET NUMBER 4 OF 72

This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service, formerly Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 1992-1994 aerial photography.

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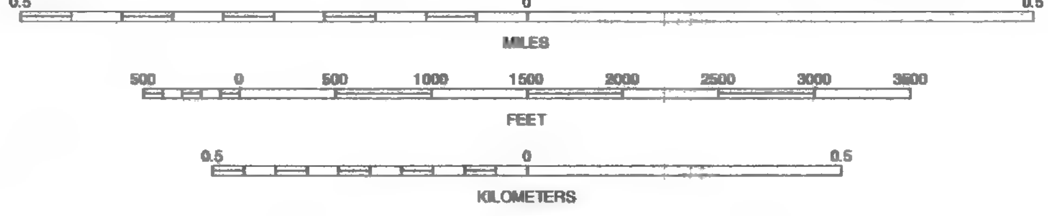
QUARTER QUADRANGLE LOCATION

SCALE 1:12000



1	2	3
4		5
6	7	8

1 WEBSTER SE
2 SCRIBNER SW SW
3 SCRIBNER SW SE
4 NORTH BEND NE
5 MALMO NW NE
6 NORTH BEND SE
7 MALMO NW SW
8 MALMO NW SE

INDEX TO ADJOINING 3.75 MAPS

MALMO NW NW, NEBRASKA
3.75 MINUTE SERIES
SHEET NUMBER 4 OF 72

96°56'15" R. 4 E. R. 5 E. (Joins sheet 1) 96°52'30"

41°26'15" 41°26'15"

T. 17 N.
T. 16 N.

(Joins sheet 6)

41°22'30" 41°22'30"

96°56'15" R. 4 E. R. 5 E. (Joins sheet 13) 96°52'30"

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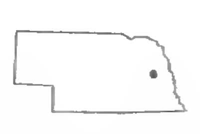
NORTH



QUARTER QUADRANGLE LOCATION

SCALE 1:12000

0.5 0 0.5
MILES

500 0 500 1000 1500 2000 2500 3000 3500
FEET

0.5 0 0.5
KILOMETERS

1	2	3
4		5
6	7	8

1 ROGERS NW
2 ROGERS NE
3 NORTH BEND NW
4 ROGERS SW
5 NORTH BEND SW
6 BRUNO NW
7 BRUNO NE
8 PRAGUE NW

INDEX TO ADJOINING 3.75 MAPS

ROGERS SE, NEBRASKA
3.75 MINUTE SERIES
SHEET NUMBER 5 OF 72

96°52'30"
41°26'15"
R. 5 E.
(Joins sheet 2)
96°48'45"
41°26'15"

(Joins sheet 5)

(Joins sheet 7)

T. 17 N.
T. 16 N.

41°22'30"
96°52'30"
R. 5 E.
(Joins sheet 14)
41°22'30"
96°48'45"

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North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUARTER QUADRANGLE LOCATION

SCALE 1:12000

0.5 0 0.5
MILES

500 0 500 1000 1500 2000 2500 3000 3500
FEET

0.5 0 0.5
KILOMETERS

1	2	3
4		5
6	7	8

1 ROGERS NE
2 NORTH BEND NW
3 NORTH BEND NE
4 ROGERS SE
5 NORTH BEND SE
6 BRUNO NE
7 PRAGUE NW
8 PRAGUE NE

INDEX TO ADJOINING 3.75 MAPS

NORTH BEND SW, NEBRASKA

3.75 MINUTE SERIES
SHEET NUMBER 6 OF 72

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

SAUNDERS COUNTY, NEBRASKA
NORTH BEND SE QUADRANGLE
SHEET NUMBER 7 OF 72

96° 48'45" 41° 26'15" R. 5 E. R. 6 E. (Joins sheet 3) 96° 45'00" 41° 26'15"

41° 22'30" 96° 48'45" R. 5 E. R. 6 E. (Joins sheet 15) 41° 22'30" 96° 45'00"

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North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUARTER QUADRANGLE LOCATION

SCALE 1:12000

0.5 0 0.5
MILES

500 0 500 1000 1500 2000 2500 3000 3500
FEET

0.5 0 0.5
KILOMETERS

1	2	3
4		5
6	7	8

1 NORTH BEND NW
2 NORTH BEND NE
3 MALMO NW NW
4 NORTH BEND SW
5 MALMO NW SW
6 PRAGUE NW
7 PRAGUE NE
8 MALMO NW

INDEX TO ADJOINING 3.75 MAPS

NORTH BEND SE, NEBRASKA
3.75 MINUTE SERIES
SHEET NUMBER 7 OF 72

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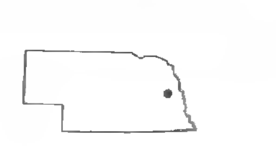
NORTH



QUARTER QUADRANGLE LOCATION

SCALE 1:12000

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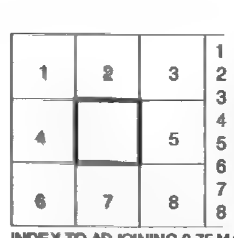
MILES
500 0 500 1000 1500 2000 2500 3000 3500
FEET
0.5 0 0.5
KILOMETERS



1 NORTH BEND NE
2 MALMO NW NW
3 MALMO NW NE
4 NORTH BEND SE
5 MALMO NW SE
6 PRAGUE NE
7 MALMO NW
8 MALMO NE

INDEX TO ADJOINING 3.75 MAPS

MALMO NW SW, NEBRASKA

3.75 MINUTE SERIES
SHEET NUMBER 8 OF 72

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

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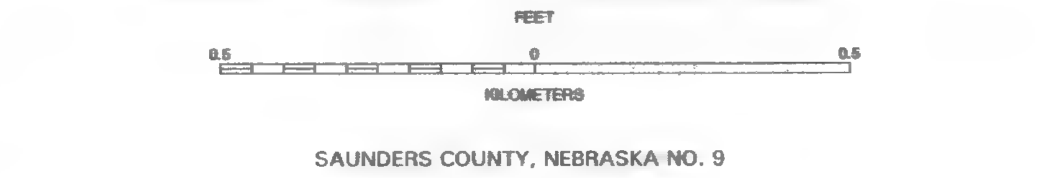

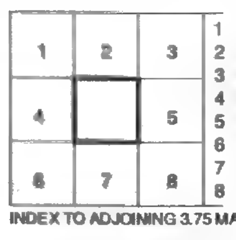

1 MALMO NW NW
2 MALMO NW NE
3 FREMONT WEST NW
4 MALMO NW SW
5 FREMONT WEST SW
6 MALMO NW
7 MALMO NE
8 COLON NW

INDEX TO ADJOINING 3.75 MAPS

MALMO NW SE, NEBRASKA
3.75 MINUTE SERIES
SHEET NUMBER 9 OF 72

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

96° 37'30"
41° 26'15"
R. 7 E.
96° 33'45"
41° 26'15"

41° 22'30"
96° 37'30"
(Joins sheet 18)
41° 22'30"
R. 7 E. R. 8 E.
96° 33'45"

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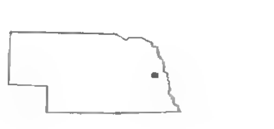
NORTH



QUARTER QUADRANGLE LOCATION

SCALE 1:12000

0.5 0 0.5
MILES

500 0 500 1000 1500 2000 2500 3000 3500
FEET

0.5 0 0.5
KILOMETERS

1	2	3
4		5
6	7	8

1 MALMO NW NE
2 FREMONT WEST NW
3 FREMONT WEST NE
4 MALMO NW SE
5 FREMONT WEST SE
6 MALMO NE
7 COLON NW
8 COLON NE

INDEX TO ADJOINING 3.75 MAPS

FREMONT WEST SW, NEBRASKA
3.75 MINUTE SERIES
SHEET NUMBER 10 OF 72

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

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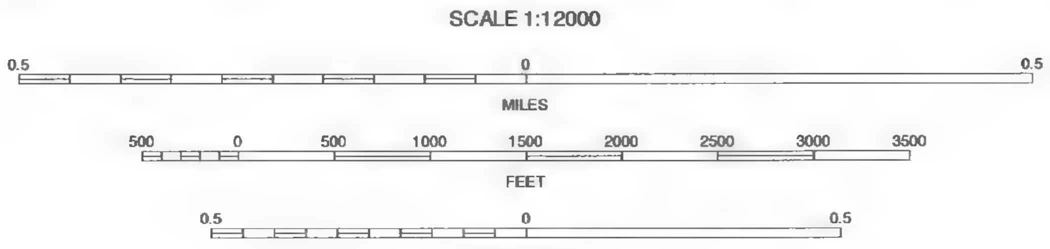

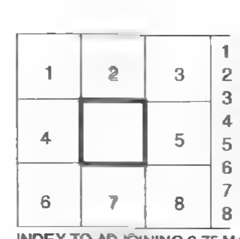

1 FREMONT WEST NW
2 FREMONT WEST NE
3 FREMONT EAST NW
4 FREMONT WEST SW
5 FREMONT EAST SW
6 COLON NW
7 COLON NE
8 LESHARA NW

INDEX TO ADJOINING 3.75 MAPS

FREMONT WEST SE, NEBRASKA
3.75 MINUTE SERIES
SHEET NUMBER 11 OF 72

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

SAUNDERS COUNTY, NEBRASKA
FREMONT EAST SW QUADRANGLE
SHEET NUMBER 12 OF 72

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North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUARTER QUADRANGLE LOCATION

SCALE 1:12000

MILES

FEET

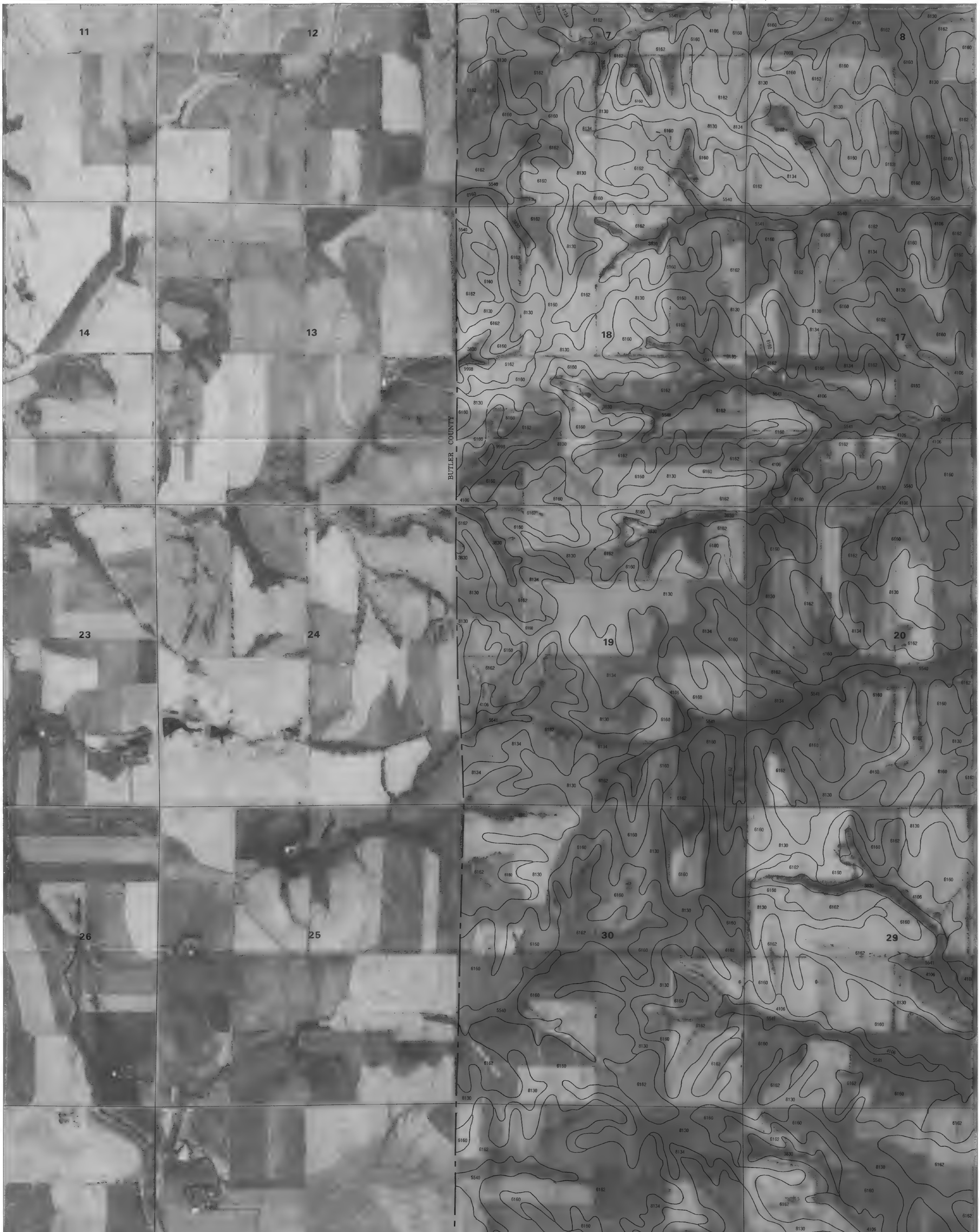
KILOMETERS

1	2	3
4		5
6	7	8

1 FREMONT WEST NE
2 FREMONT EAST NW
3 FREMONT EAST NE
4 FREMONT WEST SE
5 FREMONT EAST SE
6 COLON NE
7 LESHARA NW
8 LESHARA NE

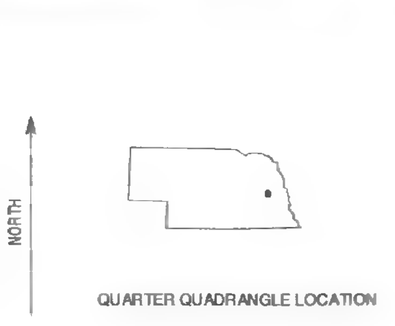
INDEX TO ADJOINING 3.75 MAPS

FREMONT EAST SW, NEBRASKA
3.75 MINUTE SERIES
SHEET NUMBER 12 OF 72

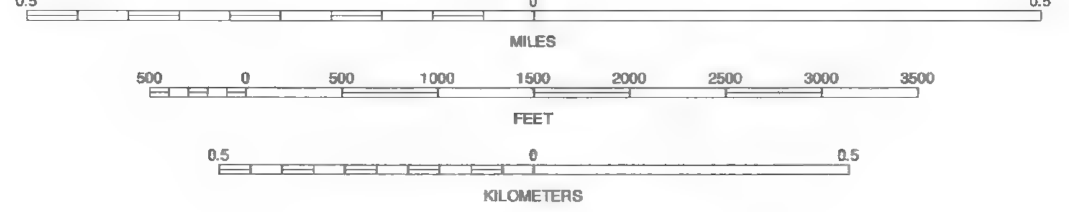


This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service, formerly Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 1992-1994 aerial photography.

North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.



SCALE 1:12000



1	2	3	1 ROGERS SW 2 ROGERS SE 3 NORTH BEND SW
4		5	4 BRUNO NW 5 PRAGUE NW
6	7	8	6 BRUNO SW 7 BRUNO SE 8 PRAGUE SW

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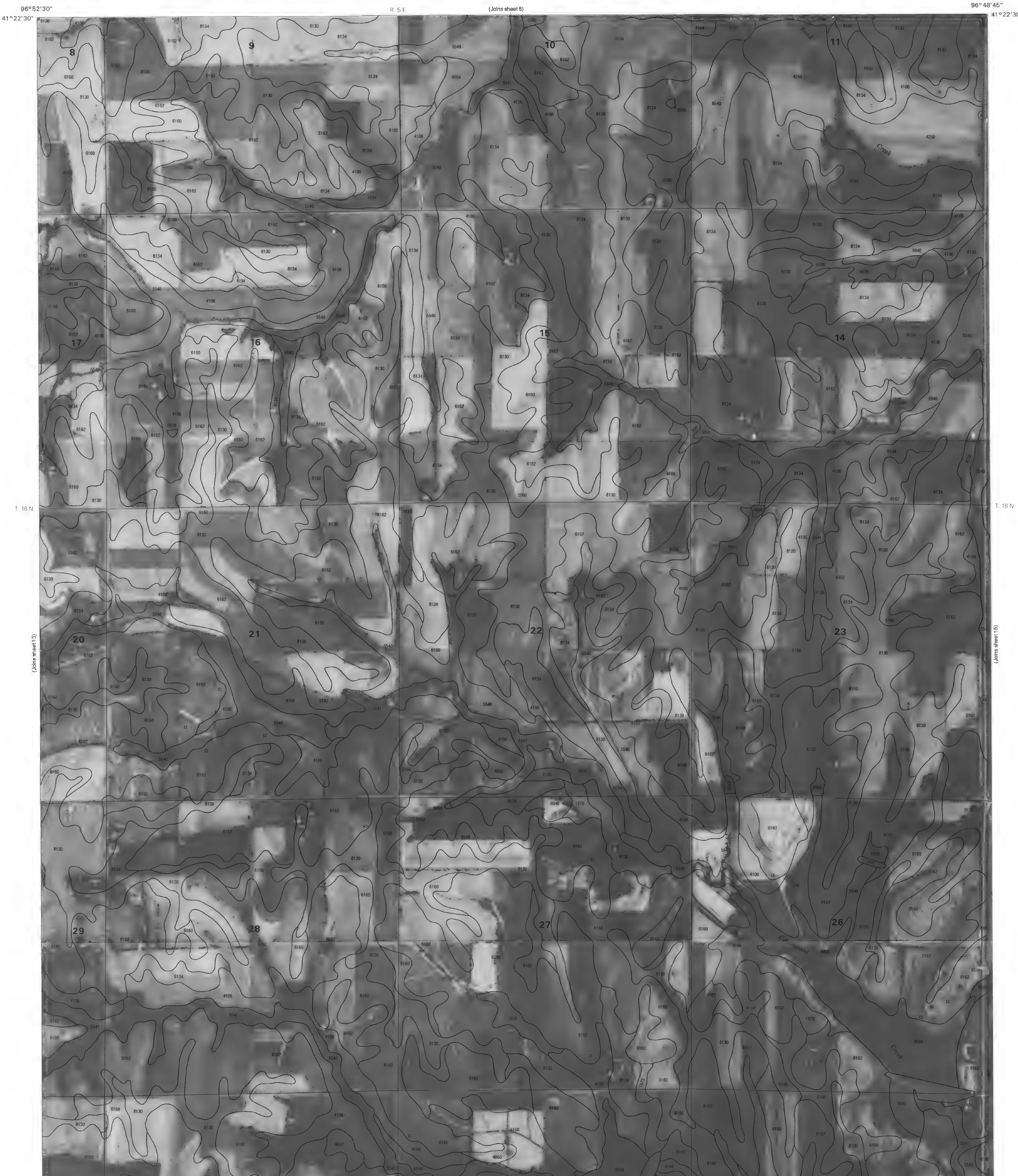
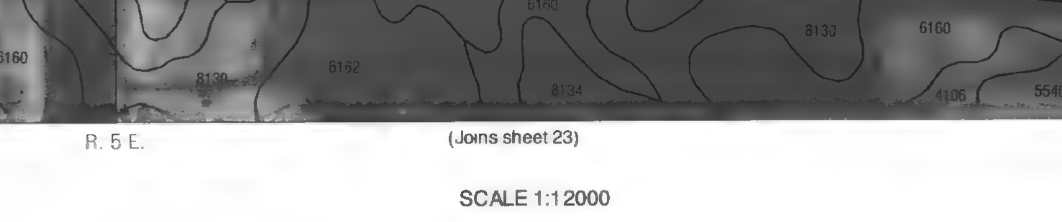
BRUNO NE, NEBRASKA
3.75 MINUTE SERIES
SHEET NUMBER 13 OF 72

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

SAUNDERS COUNTY, NEBRASKA
PRAGUE NW QUADRANGLE
SHEET NUMBER 14 OF 72



SCALE 1:12000



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North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

QUARTER QUADRANGLE LOCATION

1 ROGERS SE
2 NORTH BEND SW
3 NORTH BEND SE
4 BRUNO NE
5 PRAGUE NE
6 BRUNO SE
7 PRAGUE SW
8 PRAGUE SE

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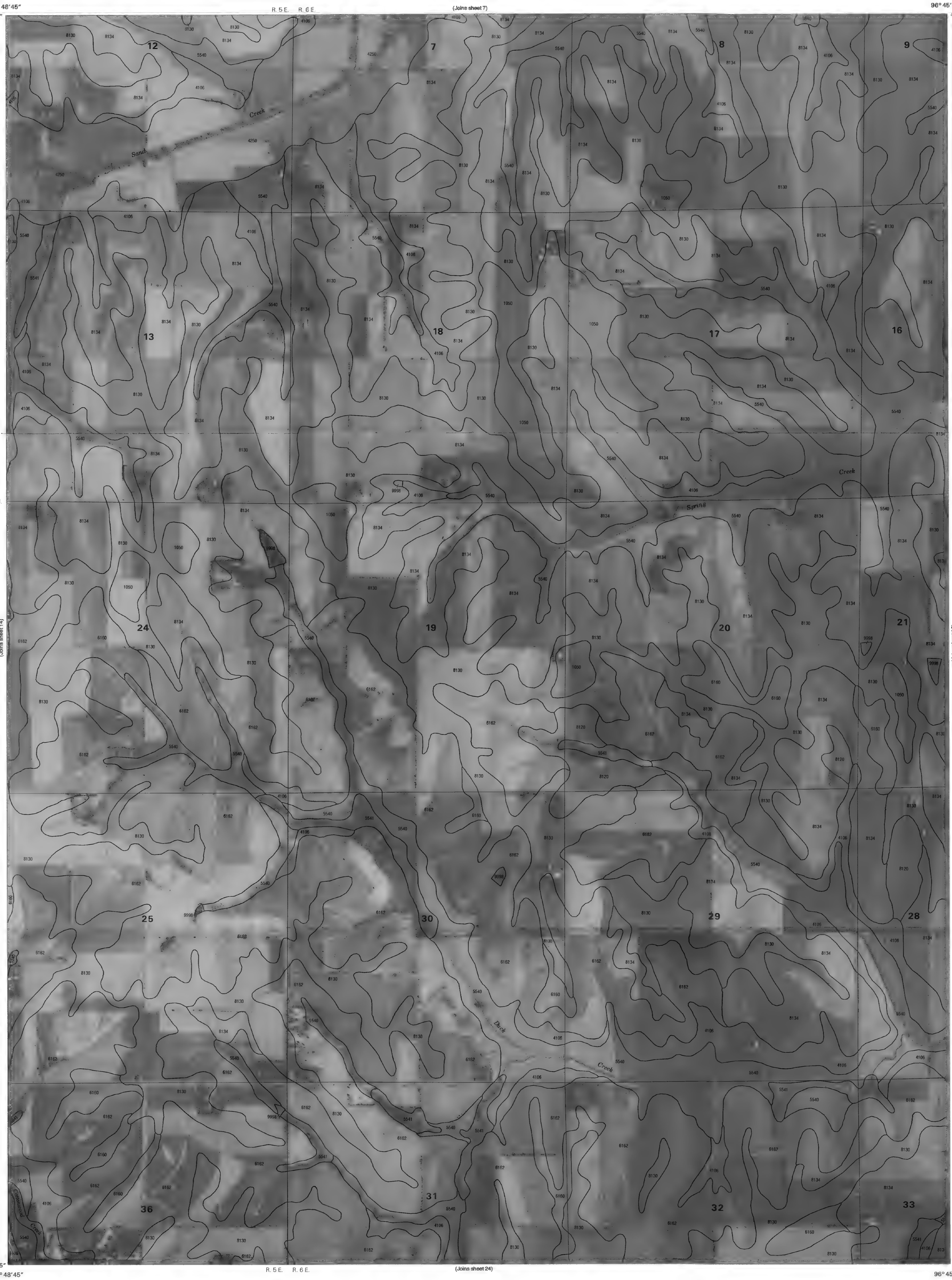
PRAGUE NW, NEBRASKA
3.75 MINUTE SERIES
SHEET NUMBER 14 OF 72



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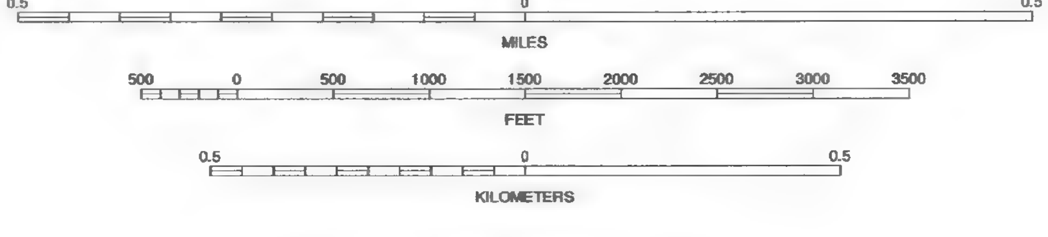
North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

SCALE 1:12000



1	2	3
4		5
6	7	8

1 NORTH BEND SW
2 NORTH BEND SE
3 MALMO NW SW
4 PRAGUE NW
5 MALMO NW
6 PRAGUE SW
7 PRAGUE SE
8 MALMO SW

INDEX TO ADJOINING 3.75 MAPS

PRAGUE NE, NEBRASKA
3.75 MINUTE SERIES
SHEET NUMBER 15 OF 72

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service, formerly Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 1992-1994 aerial photography.

North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUARTER QUADRANGLE LOCATION

SCALE 1:12000

0.5 0 0.5
MILES

500 0 500 1000 1500 2000 2500 3000 3500
FEET

0.5 0 0.5
KILOMETERS

1	2	3
4		5
6	7	8

1 NORTH BEND SE
2 MALMO NW SW
3 MALMO NW SE
4 PRAGUE NE
5 MALMO NE
6 PRAGUE SE
7 MALMO SW
8 MALMO SE

INDEX TO ADJOINING 3.75 MAPS

MALMO NW, NEBRASKA
3.75 MINUTE SERIES
SHEET NUMBER 16 OF 72

This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service, formerly Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 1992-1994 aerial photography.

North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

QUARTER QUADRANGLE LOCATION

SCALE 1:12000

0.5 0 0.5
MILES

500 0 500 1000 1500 2000 2500 3000 3500
FEET

0.5 0 0.5
KILOMETERS

1	2	3
4		5
6	7	8

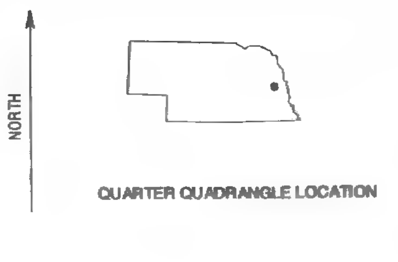
1 MALMO NW SW
2 MALMO NW SE
3 FREMONT WEST SW
4 MALMO NW
5 COLON NW
6 MALMO SW
7 MALMO SE
8 COLON SW

INDEX TO ADJOINING 3.75 MAPS

MALMO NE, NEBRASKA
3.75 MINUTE SERIES
SHEET NUMBER 17 OF 72

This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service, formerly Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 1992-1994 aerial photography.

North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.



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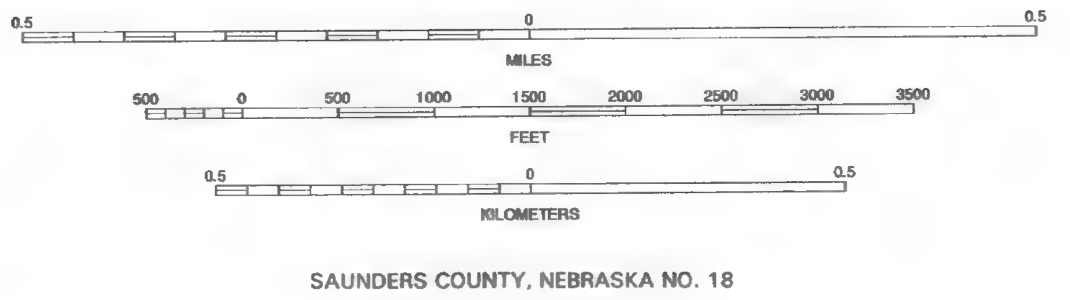
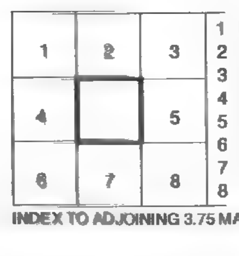


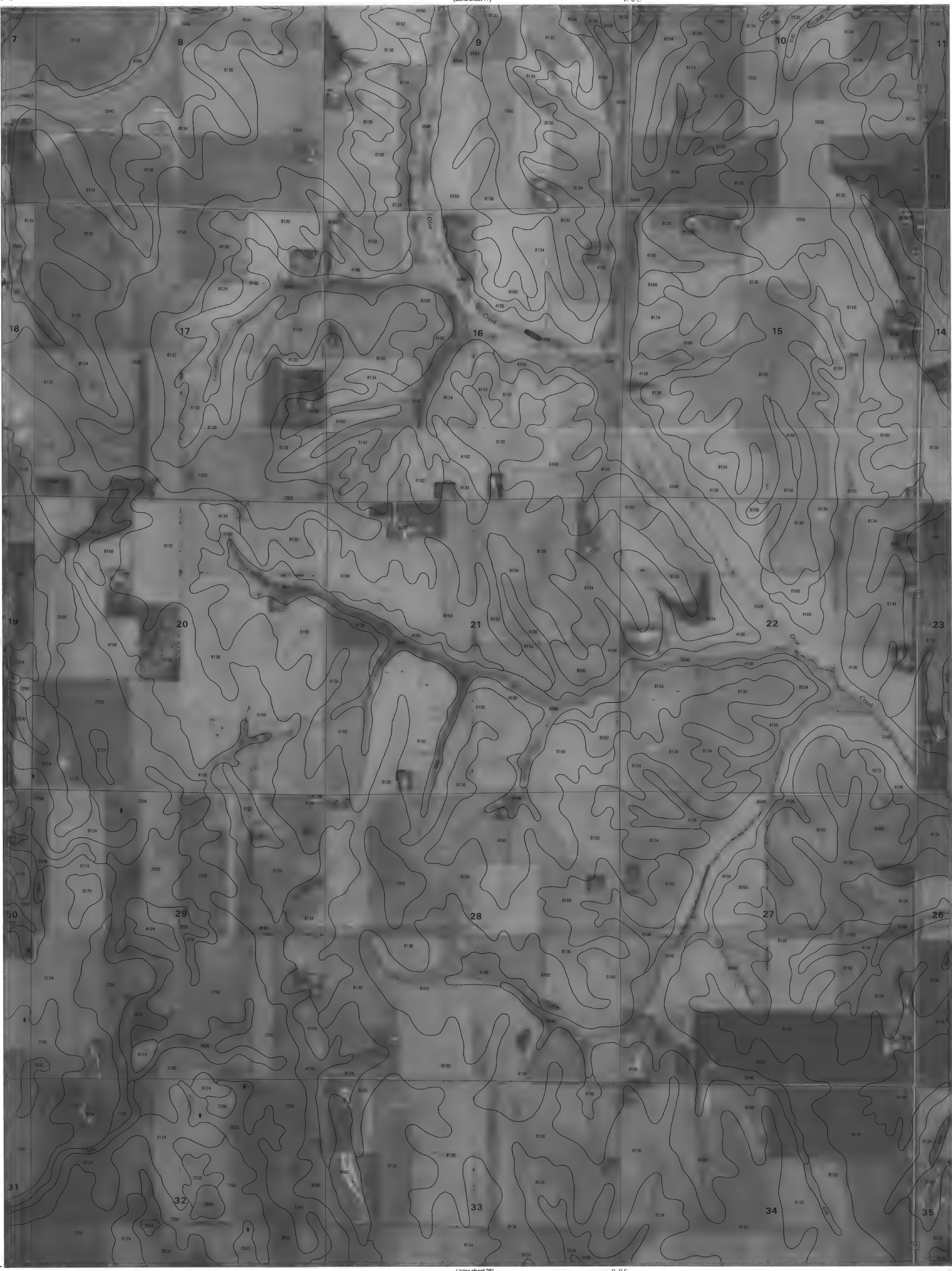


1 MALMO NW SE
2 FREMONT WEST SW
3 FREMONT WEST SE
4 MALMO NE
5 COLON NE
6 MALMO SE
7 COLON SW
8 COLON SE

COLON NW, NEBRASKA
3.75 MINUTE SERIES
SHEET NUMBER 18 OF 72

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

SAUNDERS COUNTY, NEBRASKA
COLON NE QUADRANGLE
SHEET NUMBER 19 OF 72



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North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUARTER QUADRANGLE LOCATION

SCALE 1:12000

MILES

FEET

KILOMETERS

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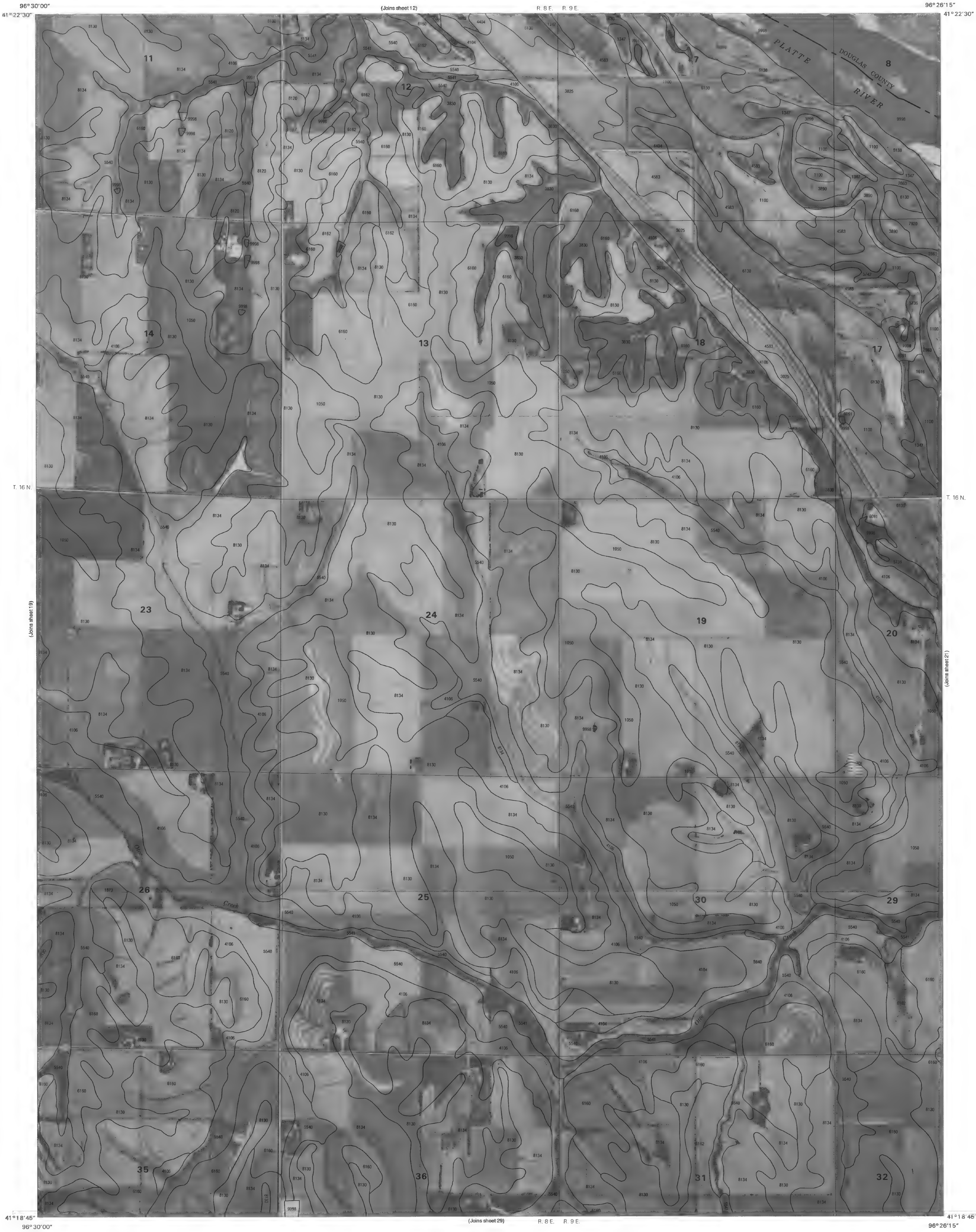
1 FREMONT WEST SW
2 FREMONT WEST SE
3 FREMONT EAST SW
4 COLON NW
5 LESHARA NW
6 COLON SW
7 COLON SE
8 LESHARA SW

COLON NE, NEBRASKA
3.75 MINUTE SERIES
SHEET NUMBER 19 OF 72



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North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUARTER QUADRANGLE LOCATION

SCALE 1:12000

0.5 — 0 — 0.5 MILES

500 0 500 1000 1500 2000 2500 3000 3500 FEET

0.5 — 0 — 0.5 KILOMETERS

1	2	3
4		5
6	7	8

1 FREMONT WEST SE
2 FREMONT EAST SW
3 FREMONT EAST SE
4 COLON NE
5 LESHARA NE
6 COLON SE
7 LESHARA SW
8 LESHARA SE

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LESHARA NW, NEBRASKA

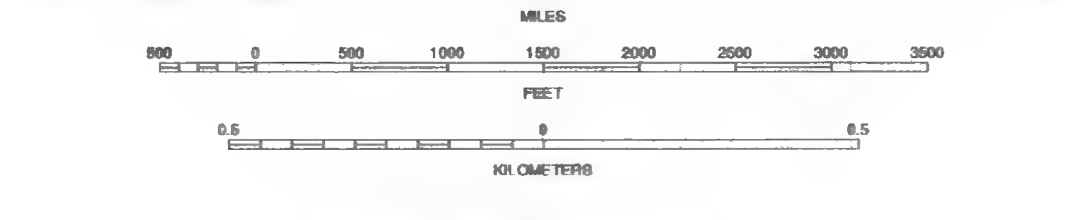
3.75 MINUTE SERIES
SHEET NUMBER 20 OF 72

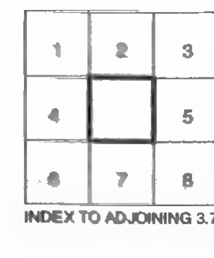
This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service, formerly Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 1992-1994 aerial photography.

North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

QUARTER QUADRANGLE LOCATION

SCALE 1:12000





1 FREMONT EAST SW
2 FREMONT EAST SE
3 ARLINGTON SW
4 LESHARA NW
5 VALLEY NW
6 LESHARA SW
7 LESHARA SE
8 VALLEY SW

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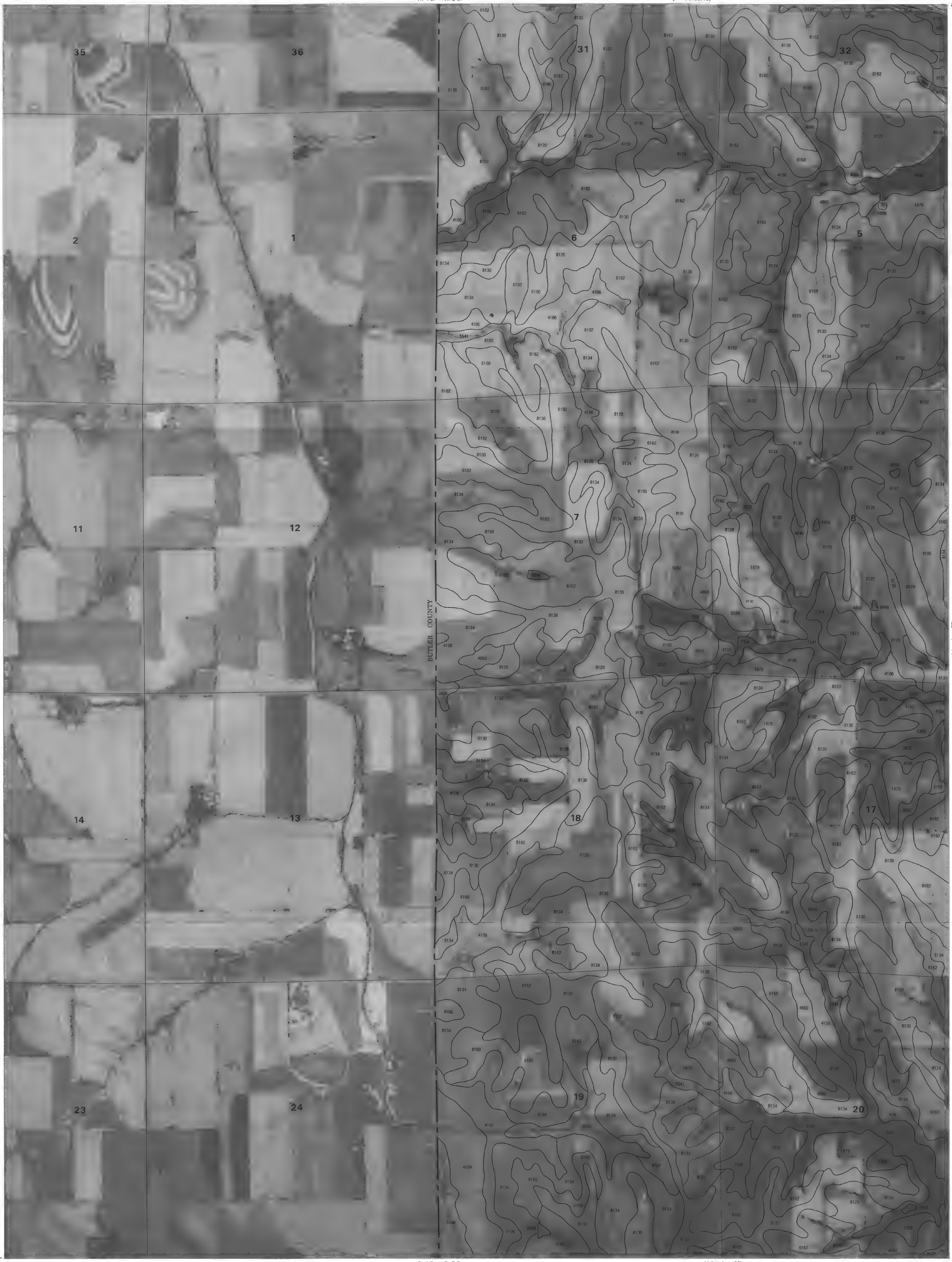
LESHARA NE, NEBRASKA
3.75 MINUTE SERIES
SHEET NUMBER 21 OF 72

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE



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North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUARTER QUADRANGLE LOCATION

SCALE 1:12000

0.5 0 0.5
MILES

500 0 500 1000 1500 2000 2500 3000 3500
FEET

0.5 0 0.5
KILOMETERS

1	2	3
4		5
6	7	8

1 BRUNO NW
2 BRUNO NE
3 PRAGUE NW
4 BRUNO SW
5 PRAGUE SW
6 LOMA NW
7 LOMA NE
8 TOUHY NW

INDEX TO ADJOINING 3.75 MAPS

BRUNO SE, NEBRASKA
3.75 MINUTE SERIES
SHEET NUMBER 22 OF 72

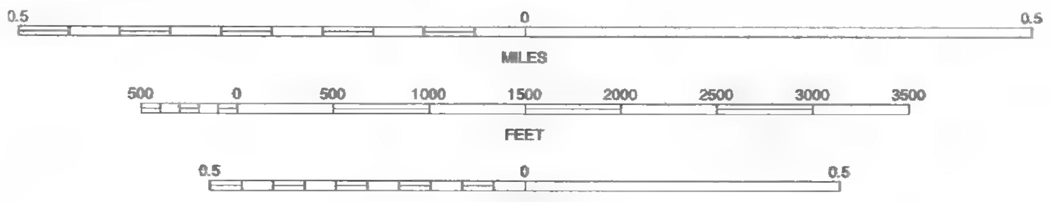
UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

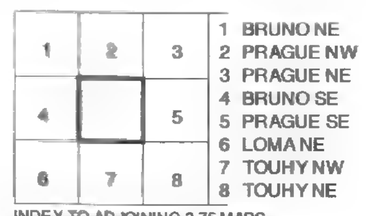
SAUNDERS COUNTY, NEBRASKA
PRAGUE SW QUADRANGLE
SHEET NUMBER 23 OF 72

This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service, formerly Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 1992-1994 aerial photography.

North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

SCALE 1:12000





PRAGUE SW, NEBRASKA
3.75 MINUTE SERIES
SHEET NUMBER 23 OF 72

96° 48′45″ 41° 18′45″ R. 5 E. R. 6 E. (Joins sheet 15) 96° 45′00″ 41° 18′45″

T. 16 N.
T. 15 N.

(Joins sheet 23) (Joins sheet 25)

41° 15′00″ 96° 48′45″ R. 5 E. R. 6 E. (Joins sheet 34) 41° 15′00″ 96° 45′00″

SCALE 1:12000

0.5 0 0.5 MILES

500 0 500 1000 1500 2000 2500 3000 3500 FEET

0.5 0 0.5 KILOMETERS

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North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUARTER QUADRANGLE LOCATION

1	2	3
4		5
6	7	8

1 PRAGUE NW
2 PRAGUE NE
3 MALMO NW
4 PRAGUE SW
5 MALMO SW
6 TOUHY NW
7 TOUHY NE
8 WAHOO WEST NW

INDEX TO ADJOINING 3.75 MAPS

PRAGUE SE, NEBRASKA
3.75 MINUTE SERIES
SHEET NUMBER 24 OF 72

This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service, formerly Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 1992-1994 aerial photography.

North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUARTER QUADRANGLE LOCATION

SCALE 1:12000

0.5 0 0.5
MILES

500 0 500 1000 1500 2000 2500 3000 3500
FEET

0.5 0 0.5
KILOMETERS

1	2	3
4		5
6	7	8

1 PRAGUE NE
2 MALMO NW
3 MALMO NE
4 PRAGUE SE
5 MALMO SE
6 TOUHY NE
7 WAHOO WEST NW
8 WAHOO WEST NE

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MALMO SW, NEBRASKA
3.75 MINUTE SERIES
SHEET NUMBER 25 OF 72

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

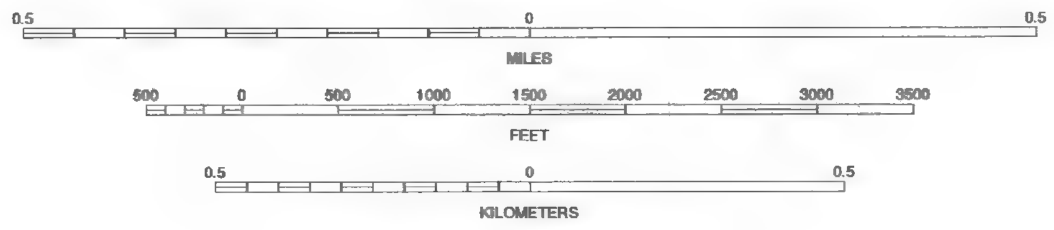
SAUNDERS COUNTY, NEBRASKA
MALMO SE QUADRANGLE
SHEET NUMBER 26 OF 72

This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service, formerly Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 1992-1994 aerial photography.

North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

QUARTER QUADRANGLE LOCATION

SCALE 1:12000



1	2	3
4		5
6	7	8

1 MALMO NW
2 MALMO NE
3 COLON NW
4 MALMO SW
5 COLON SW
6 WAHOO WEST NW
7 WAHOO WEST NE
8 WAHOO EAST NW

INDEX TO ADJOINING 3.75 MAPS

MALMO SE, NEBRASKA
3.75 MINUTE SERIES
SHEET NUMBER 26 OF 72

96° 37′ 30″ | (Joins sheet 18) | 96° 33′ 45″

41° 18′ 45″ | R. 7 E. R. 8 E. | 41° 18′ 45″

T. 16 N.
T. 15 N.

(Joins sheet 26) | (Joins sheet 28)

41° 15′ 00″ | (Joins sheet 37) | R. 7 E. R. 8 E. 41° 15′ 00″

96° 37′ 30″ | | 96° 33′ 45″

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North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUARTER QUADRANGLE LOCATION

SCALE 1:12000

0.5 0 0.5
MILES

500 0 500 1000 1500 2000 2500 3000 3500
FEET

0.5 0 0.5
KILOMETERS

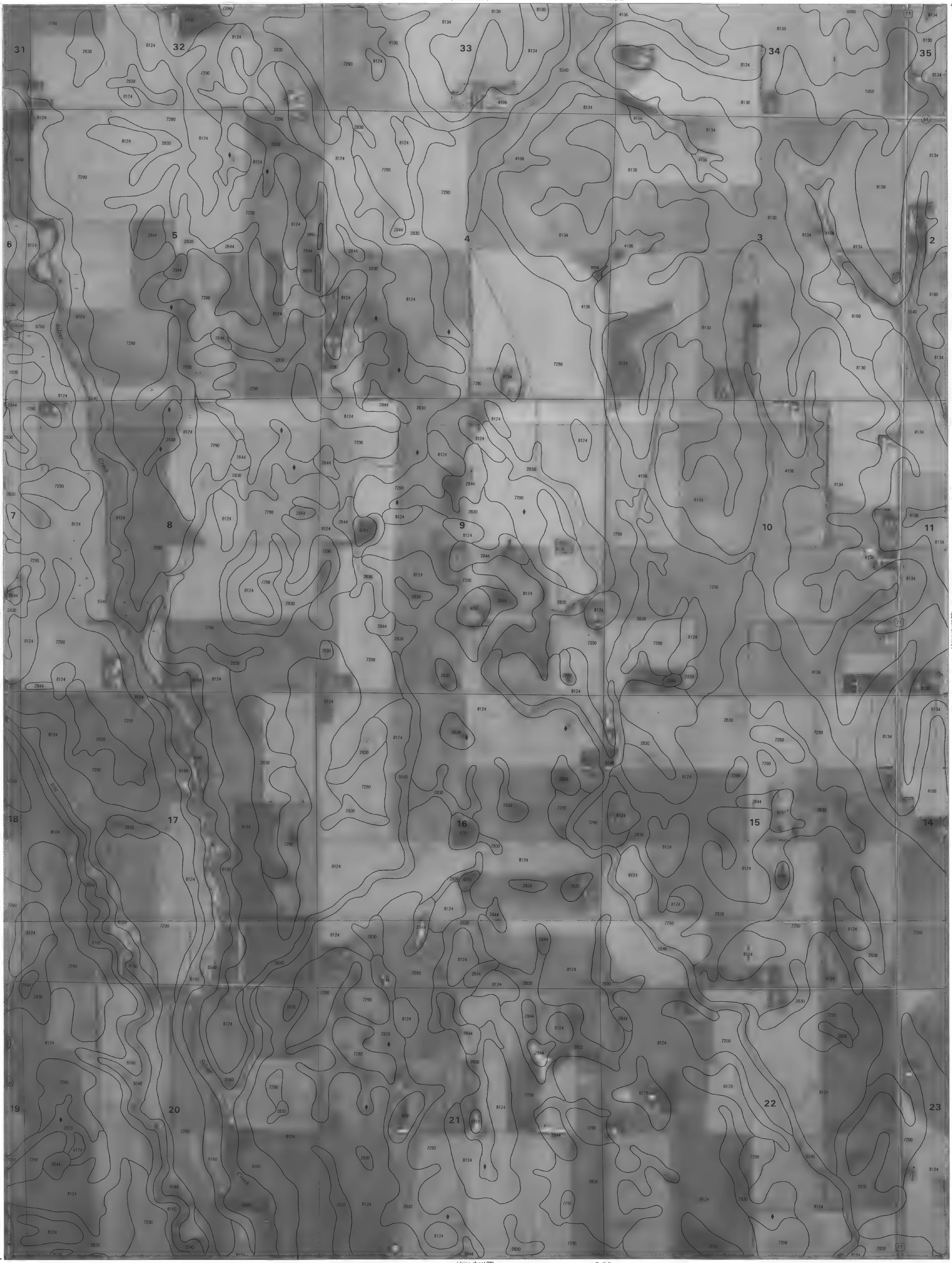
1	2	3
4		5
6	7	8

1 MALMO NE
2 COLON NW
3 COLON NE
4 MALMO SE
5 COLON SE
6 WAHOO WEST NE
7 WAHOO EAST NW
8 WAHOO EAST NE

INDEX TO ADJOINING 3.75 MAPS

COLON SW, NEBRASKA
3.75 MINUTE SERIES
SHEET NUMBER 27 OF 72

96°33′45″ 41°18′45″ (Joins sheet 19) R. 8 E. 96°30′00″ 41°18′45″



41°15′00″ 96°33′45″ (Joins sheet 38) R. 8 E. 41°15′00″ 96°30′00″

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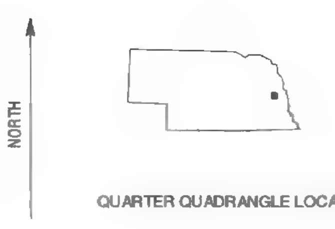
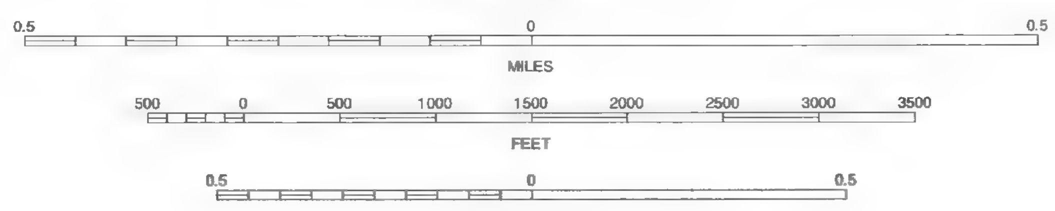
North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.



QUARTER QUADRANGLE LOCATION

SCALE 1:12000



1	2	3
4		5
6	7	8

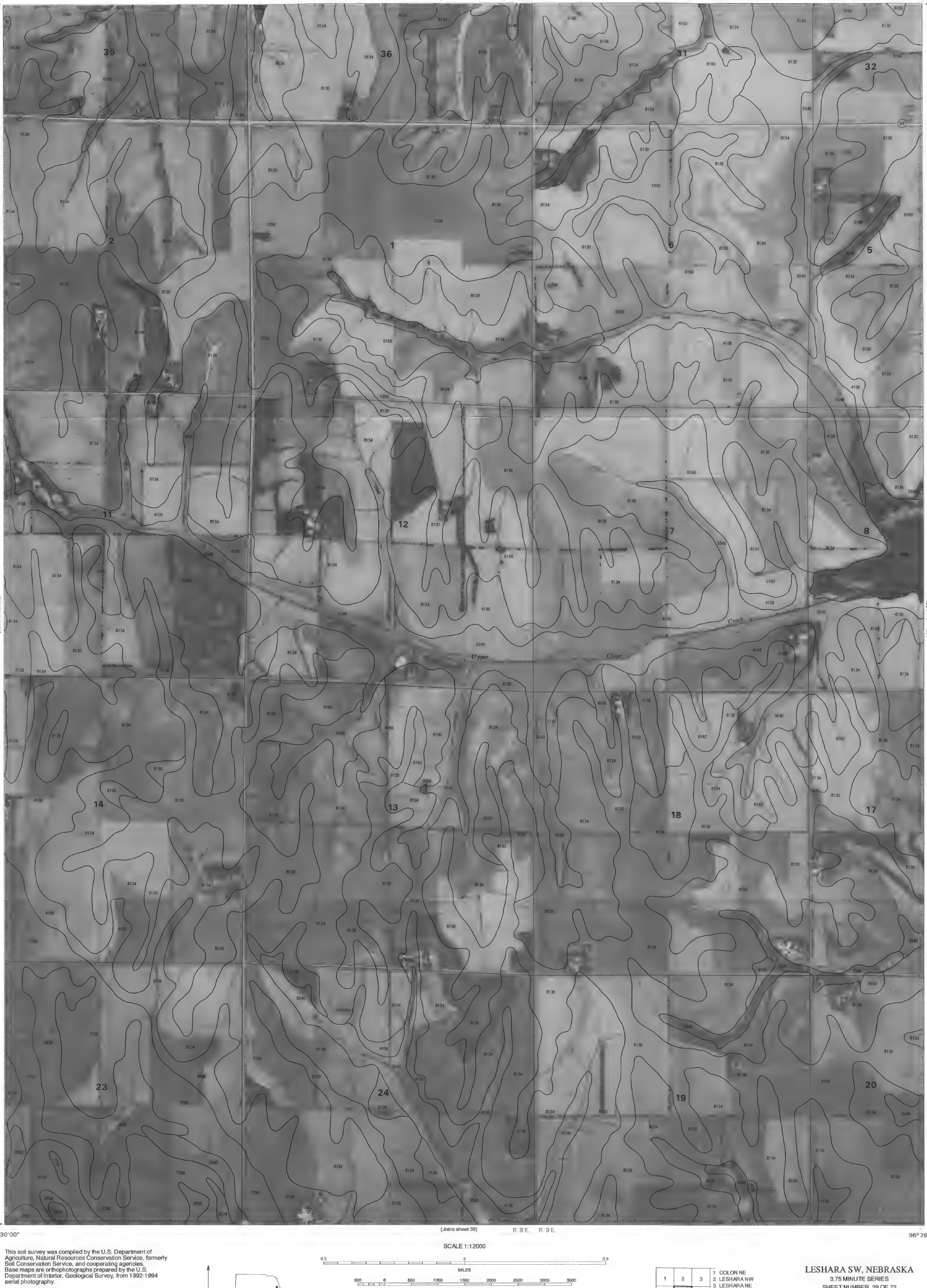
1 COLON NW
2 COLON NE
3 LESHARA NW
4 COLON SW
5 LESHARA SW
6 WAHOO EAST NW
7 WAHOO EAST NE
8 MEAD NW

INDEX TO ADJOINING 3.75 MAPS

COLON SE, NEBRASKA
3.75 MINUTE SERIES
SHEET NUMBER 28 OF 72

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

SAUNDERS COUNTY, NEBRASKA
LESHARA SW QUADRANGLE
SHEET NUMBER 29 OF 72



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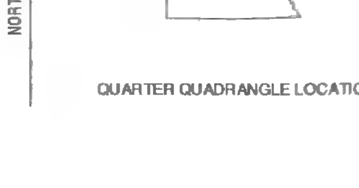
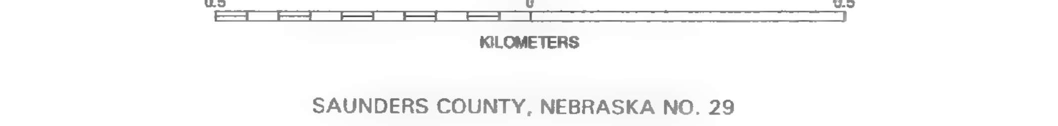
North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.



SCALE 1:12000



1	2	3	1 COLON NE
4		5	2 LESHARA NW
6	7	8	3 LESHARA NE

1 COLON NE
2 LESHARA NW
3 LESHARA NE
4 COLON SE
5 LESHARA SE
6 WAHOO EAST NE
7 MEAD NW
8 MEAD NE

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LESHARA SW, NEBRASKA
3.75 MINUTE SERIES
SHEET NUMBER 29 OF 72

96°26'15" 41°18'45" (Joins sheet 21) R. 9 E. 96°22'30" 41°18'45"

41°15'00" 96°26'15" R. 9 E. (Joins sheet 40) 41°15'00" 96°22'30"

SCALE 1:12000

0.5 0 0.5
MILES

500 0 500 1000 1500 2000 2500 3000 3500
FEET

0.5 0 0.5
KILOMETERS

This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service, formerly Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 1992-1994 aerial photography.

North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUARTER QUADRANGLE LOCATION

1	2	3
4		5
6	7	8

1 LESHARA NW
2 LESHARA NE
3 VALLEY NW
4 LESHARA SW
5 VALLEY SW
6 MEAD NW
7 MEAD NE
8 WANN NW

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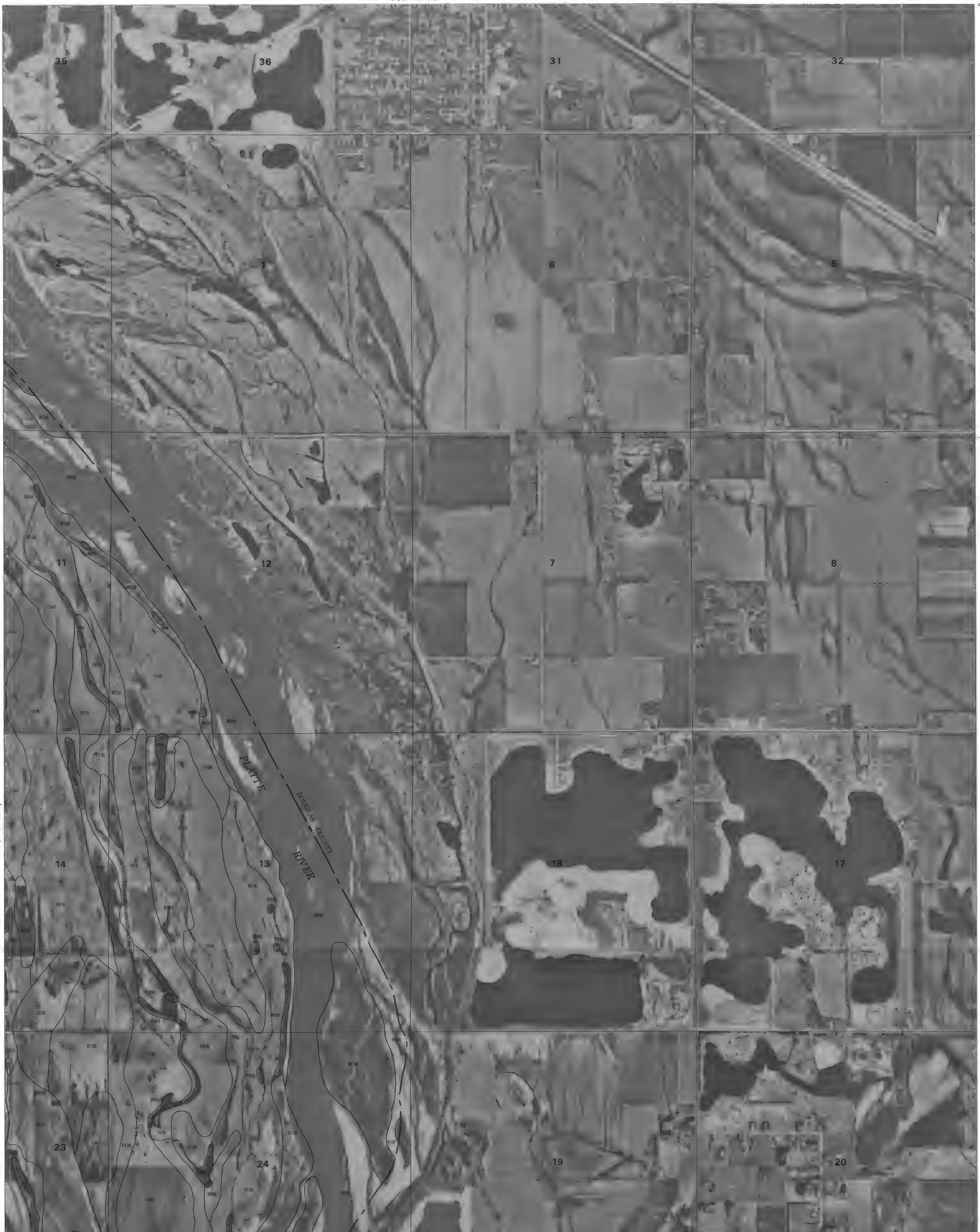
LESHARA SE, NEBRASKA
3.75 MINUTE SERIES
SHEET NUMBER 30 OF 72

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

96°22'30" 41°18'45" R.9 E. R.10 E. 96°18'45" 41°18'45"



41°15'00" 96°22'30" (Joins sheet 41) R.9 E. R.10 E. 41°15'00" 96°18'45"

This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service, formerly Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 1992-1994 aerial photography.

North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUARTER QUADRANGLE LOCATION

SCALE 1:12000

MILES: 0.5 0 0.5

FEET: 500 0 500 1000 1500 2000 2500 3000 3500

KILOMETERS: 0.5 0 0.5

1	2	3
4		5
6	7	8

1 LESHARA NE
2 VALLEY NW
3 VALLEY NE
4 LESHARA SE
5 VALLEY SE
6 MEAD NE
7 WANN NW
8 WANN NE

INDEX TO ADJOINING 3.75 MAPS

VALLEY SW, NEBRASKA
3.75 MINUTE SERIES
SHEET NUMBER 31 OF 72

96°56'15" 41°15'00" R. 4 E. R. 5 E. (Joins sheet 22) 96°52'30" 41°15'00"

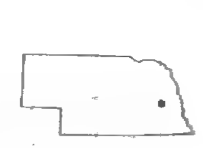
T. 15 N. T. 14 N. T. 15 N. T. 14 N. (Joins sheet 33)

41°11'15" 96°56'15" R. 4 E. R. 5 E. (Joins sheet 42) 41°11'15" 96°52'30"

This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service, formerly Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 1992-1994 aerial photography.

North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



QUARTER QUADRANGLE LOCATION

SCALE 1:12000

0.5 0 0.5
MILES

500 0 500 1000 1500 2000 2500 3000 3500
FEET

0.5 0 0.5
KILOMETERS

1	2	3
4		5
6	7	8

1 BRUNO SW
2 BRUNO SE
3 PRAGUE SW
4 LOMA NW
5 TOUHY NW
6 LOMA SW
7 LOMA SE
8 TOUHY SW

INDEX TO ADJOINING 3.75 MAPS

LOMA NE, NEBRASKA
3.75 MINUTE SERIES
SHEET NUMBER 32 OF 72

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

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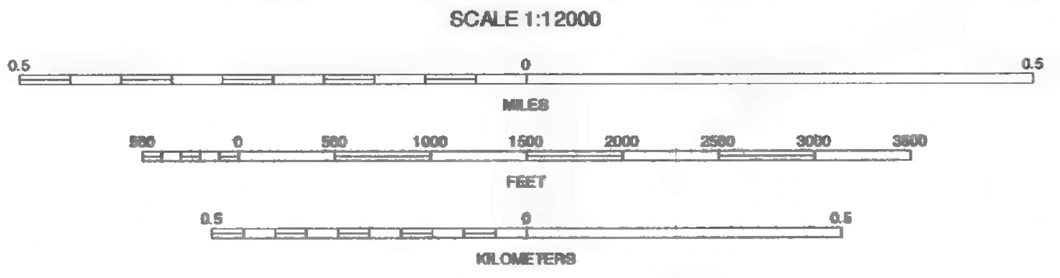
North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

QUARTER QUADRANGLE LOCATION

SCALE 1:12000



1	2	3
4		5
6	7	8

1 BRUNO SE
2 PRAGUE SW
3 PRAGUE SE
4 LOMA NE
5 TOUHY NE
6 LOMA SE
7 TOUHY SW
8 TOUHY SE

INDEX TO ADJOINING 3.75 MAPS

TOUHY NW, NEBRASKA
3.75 MINUTE SERIES
SHEET NUMBER 33 OF 72

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

SCALE 1:12000

0.5 0 0.5
MILES

500 0 500 1000 1500 2000 2500 3000 3500
FEET

0.5 0 0.5
KILOMETERS

This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service, formerly Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 1992-1994 aerial photography.

North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUARTER QUADRANGLE LOCATION

1	2	3
4		5
6	7	8

1 PRAGUE SW
2 PRAGUE SE
3 MALMO SW
4 TOUHY NW
5 WAHOO WEST NW
6 TOUHY SW
7 TOUHY SE
8 WAHOO WEST SW

INDEX TO ADJOINING 3.75 MAPS

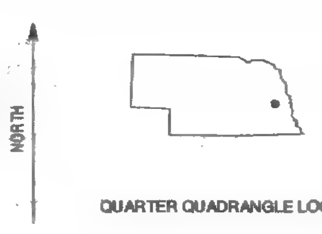
TOUHY NE, NEBRASKA
3.75 MINUTE SERIES
SHEET NUMBER 34 OF 72

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

SAUNDERS COUNTY, NEBRASKA
WAHOO WEST NW QUADRANGLE
SHEET NUMBER 35 OF 72

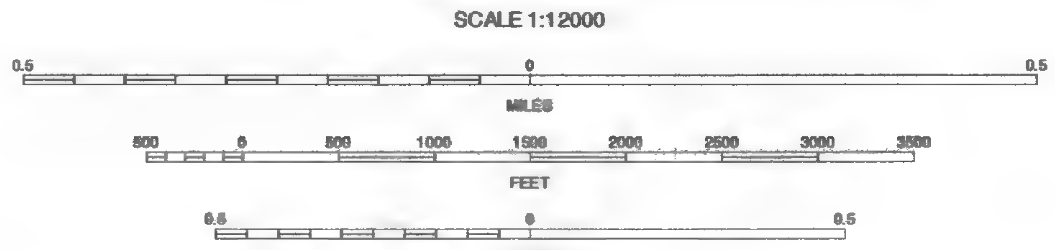
This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service, formerly Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 1992-1994 aerial photography.

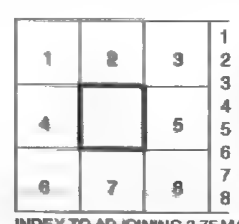
North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.



QUARTER QUADRANGLE LOCATION

SCALE 1:12000





1 PRAGUE SE
2 MALMO SW
3 MALMO SE
4 TOUHY NE
5 WAHOO WEST NE
6 TOUHY SE
7 WAHOO WEST SW
8 WAHOO WEST SE

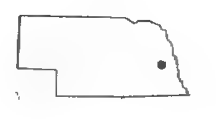
INDEX TO ADJOINING 3.75 MAPS

WAHOO WEST NW, NEBRASKA
3.75 MINUTE SERIES
SHEET NUMBER 35 OF 72

This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service, formerly Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 1992-1994 aerial photography.

North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



QUARTER QUADRANGLE LOCATION

SCALE 1:12000

0.5 0 0.5
MILES

500 0 500 1000 1500 2000 2500 3000 3500
FEET

0.5 0 0.5
KILOMETERS

1	2	3
4		5
6	7	8

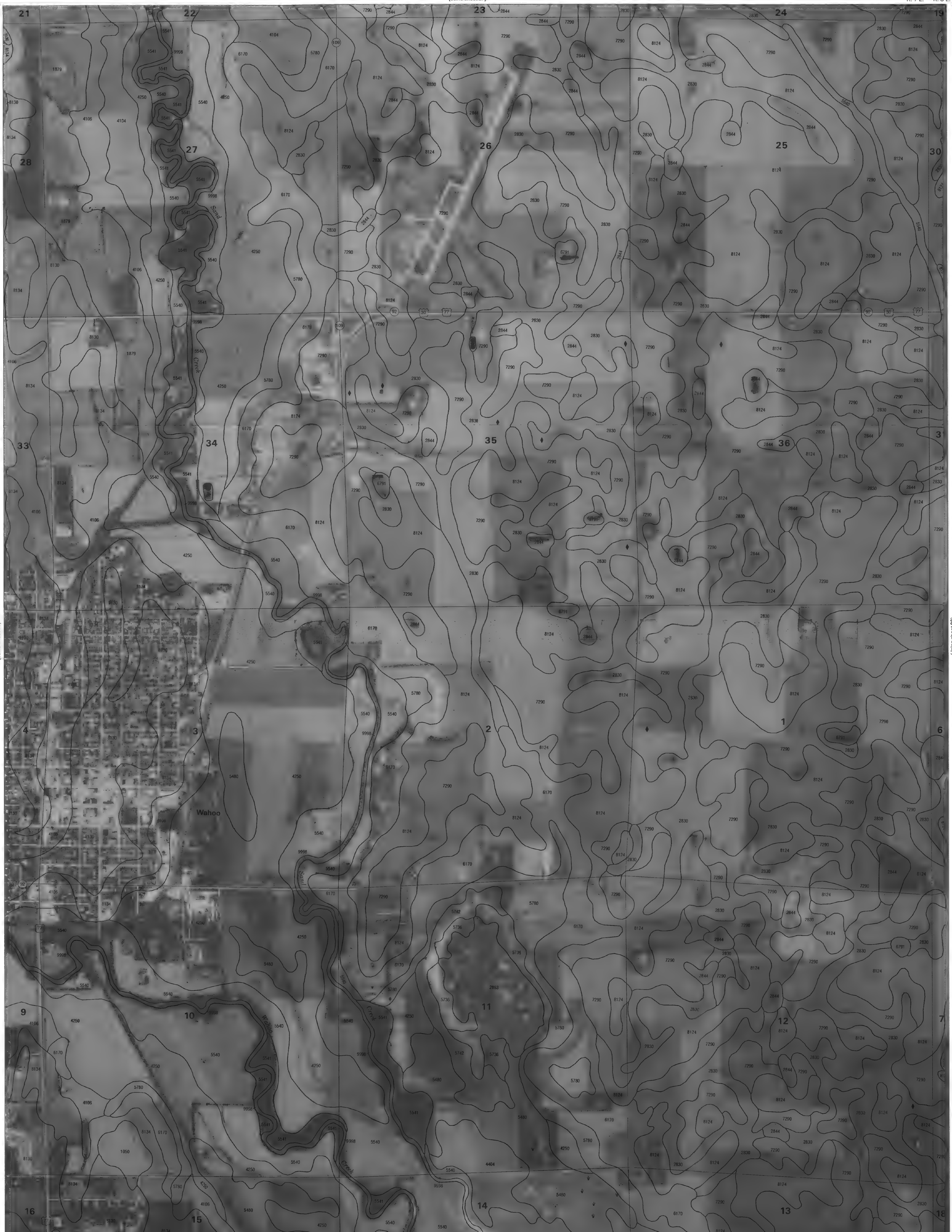
1 MALMO SW
2 MALMO SE
3 COLON SW
4 WAHOO WEST NW
5 WAHOO EAST NW
6 WAHOO WEST SW
7 WAHOO WEST SE
8 WAHOO EAST SW

INDEX TO ADJOINING 3.75 MAPS

WAHOO WEST NE, NEBRASKA
3.75 MINUTE SERIES
SHEET NUMBER 36 OF 72

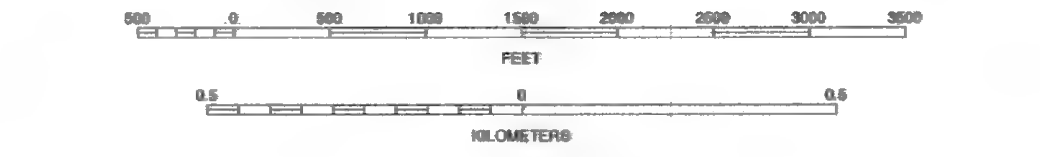
UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

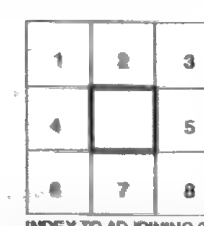
SAUNDERS COUNTY, NEBRASKA
WAHOO EAST NW QUADRANGLE
SHEET NUMBER 37 OF 72



This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service, formerly Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 1992-1994 aerial photography.

North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.





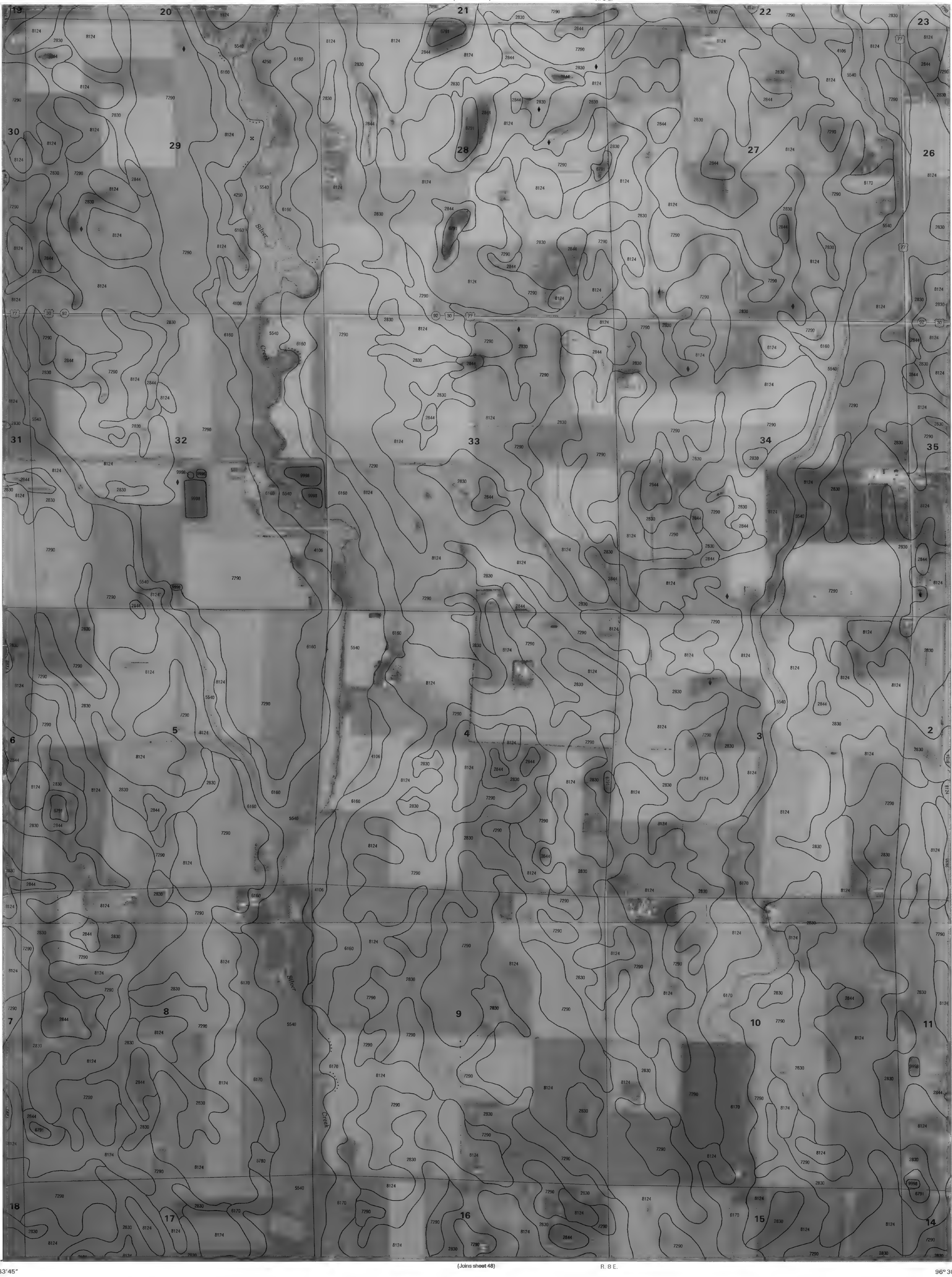
1 MALMO SE
2 COLON SW
3 COLON SE
4 WAHOO WEST NE
5 WAHOO EAST NE
6 WAHOO WEST SE
7 WAHOO EAST SW
8 WAHOO EAST SE

INDEX TO ADJOINING 3.75 MAPS

WAHOO EAST NW, NEBRASKA
3.75 MINUTE SERIES
SHEET NUMBER 37 OF 72

96°33′45″ 41°15′00″ (Joins sheet 28) R. 8 E. 96°30′00″ 41°15′00″

T. 15 N. T. 14 N. (Joins sheet 37) (Joins sheet 39)



41°11′15″ 96°33′45″ (Joins sheet 48) R. 8 E. 41°11′15″ 96°30′00″

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North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUARTER QUADRANGLE LOCATION

SCALE 1:12000

0.5 0 0.5 MILES

500 0 500 1000 1500 2000 2500 3000 3500 FEET

0.5 0 0.5 KILOMETERS

1	2	3
4		5
6	7	8

1 COLON SW
2 COLON SE
3 LESHARA SW
4 WAHOO EAST NW
5 MEAD NW
6 WAHOO EAST SW
7 WAHOO EAST SE
8 MEAD SW

INDEX TO ADJOINING 3.75 MAPS

WAHOO EAST NE, NEBRASKA
3.75 MINUTE SERIES
SHEET NUMBER 38 OF 72

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service, formerly Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 1992-1994 aerial photography.

North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUARTER QUADRANGLE LOCATION

SCALE 1:12000

MILES

FEET

KILOMETERS

1	2	3	1 COLON SE
4		5	2 LESHARA SW
6	7	8	3 LESHARA SE

4 WAHOO EAST NE
5 MEAD NE
6 WAHOO EAST SE
7 MEAD SW
8 MEAD SE

INDEX TO ADJOINING 3.75 MAPS

MEAD NW, NEBRASKA
3.75 MINUTE SERIES
SHEET NUMBER 39 OF 72

96°26'15" R. 9 E. (Joins sheet 30) 96°22'30"

41°15'00" 41°15'00"

T. 15 N.
T. 14 N.
(Joins sheet 39)
(Joins sheet 41)

41°11'15" 41°11'15"

96°26'15" R. 9 E. (Joins sheet 50) 96°22'30"

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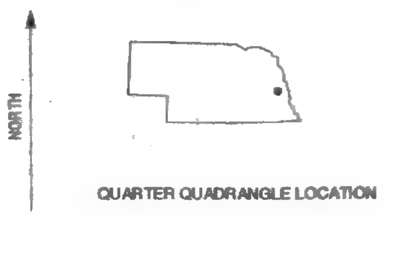
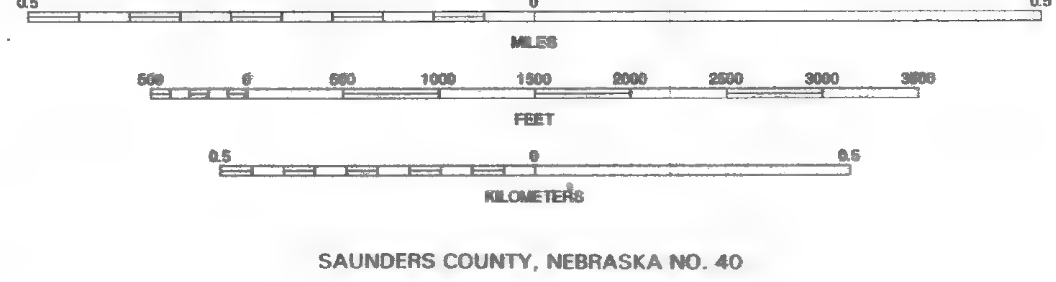
North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.



QUARTER QUADRANGLE LOCATION

SCALE 1:12000



1	2	3
4		5
6	7	8

1 LESHARA SW
2 LESHARA SE
3 VALLEY SW
4 MEAD NW
5 WANN NW
6 MEAD SW
7 MEAD SE
8 WANN SW

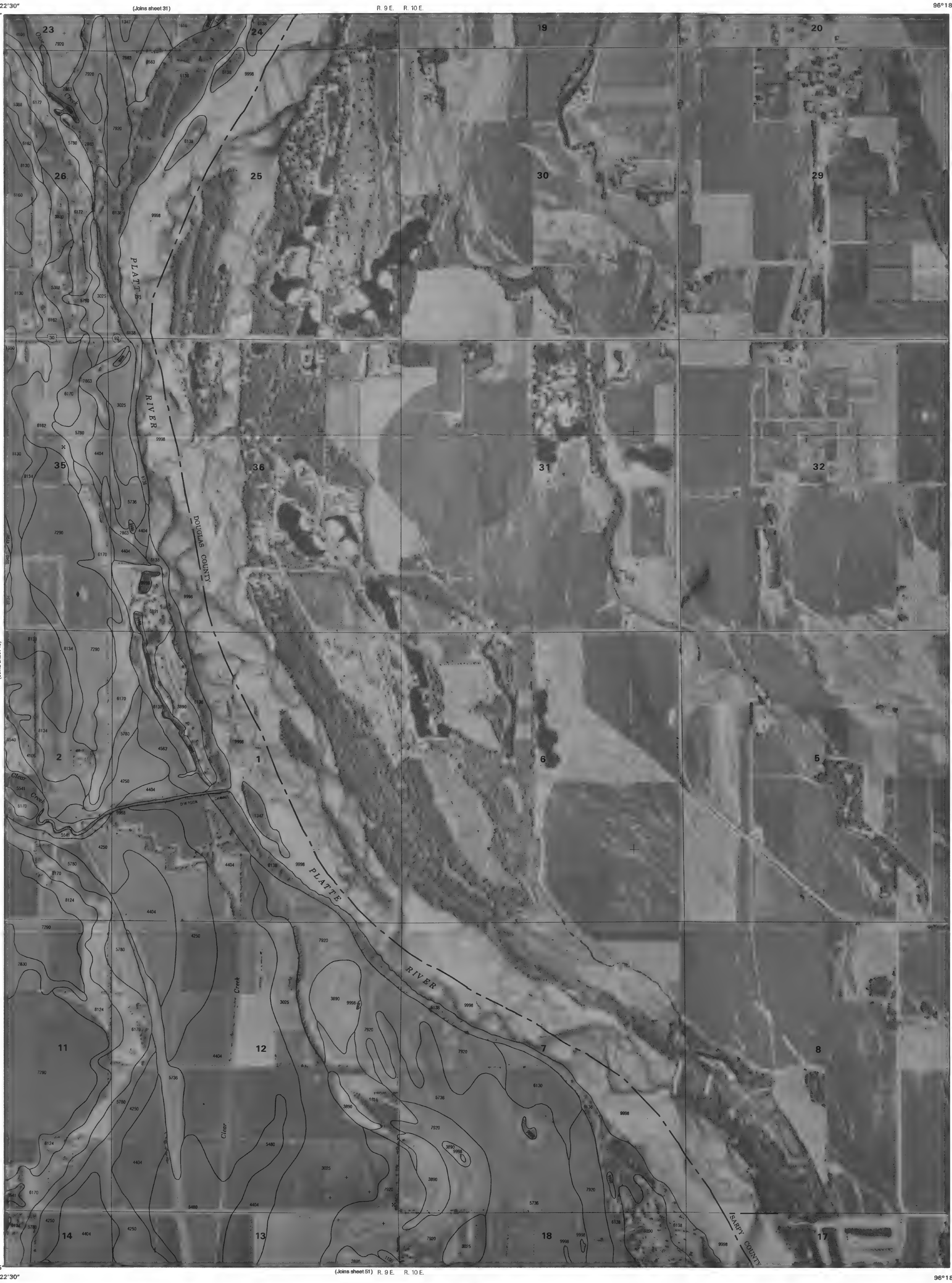
INDEX TO ADJOINING 3.75 MAPS

MEAD NE, NEBRASKA
3.75 MINUTE SERIES
SHEET NUMBER 40 OF 72

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

SAUNDERS COUNTY, NEBRASKA
WANN NW QUADRANGLE
SHEET NUMBER 41 OF 72

96° 22′30″ 41°15′00″ (Joins sheet 31) R. 9 E. R. 10 E. 96°18′45″ 41°15′00″



T. 15 N. T. 14 N. (Joins sheet 40) T. 15 N. T. 14 N.

41°11′15″ 96° 22′30″ (Joins sheet 51) R. 9 E. R. 10 E. 41°11′15″ 96°18′45″

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North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUARTER QUADRANGLE LOCATION

SCALE 1:12000

0.5 0 0.5
MILES
500 0 500 1000 1500 2000 2500 3000 3500
FEET
0.5 0 0.5
KILOMETERS

1	2	3	1 LESHARA SE
			2 VALLEY SW
4		5	3 VALLEY SE
			4 MEAD NE
6	7	8	5 WANN NE
			6 MEAD SE
			7 WANN SW
			8 WANN SE

INDEX TO ADJOINING 3.75 MAPS

WANN NW, NEBRASKA
3.75 MINUTE SERIES
SHEET NUMBER 41 OF 72

SCALE 1:12000

0.5 0 0.5
MILES

500 0 500 1000 1500 2000 2500 3000 3500
FEET

0.5 0 0.5
KILOMETERS

This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service, formerly Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 1992-1994 aerial photography.

North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUARTER QUADRANGLE LOCATION

1	2	3
4		5
6	7	8

1 LOMA NW
2 LOMA NE
3 TOUHY NW
4 LOMA SW
5 TOUHY SW
6 VALPARAISO SW NW
7 VALPARAISO SW NE
8 VALPARAISO NW

INDEX TO ADJOINING 3.75 MAPS

LOMA SE, NEBRASKA
3.75 MINUTE SERIES
SHEET NUMBER 42 OF 72

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

SAUNDERS COUNTY, NEBRASKA
TOUHY SW QUADRANGLE
SHEET NUMBER 43 OF 72

96°52'30"	R. 5 E.	(Joins sheet 33)	96°48'45"

41°11'15"	41°11'15"

41°07'30"	41°07'30"

96°52'30"	R. 5 E.	(Joins sheet 53)	96°48'45"

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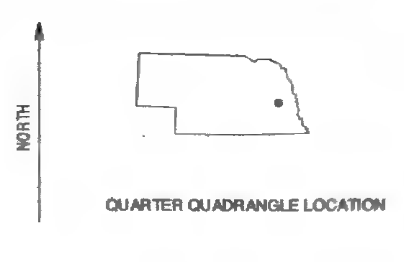
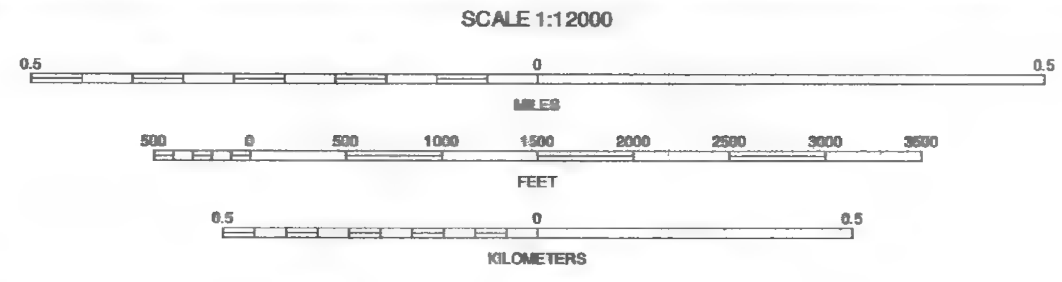
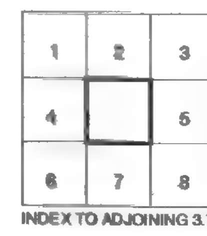
North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.



QUARTER QUADRANGLE LOCATION

SCALE 1:12000





1 LOMA NE
2 TOUHY NW
3 TOUHY NE
4 LOMA SE
5 TOUHY SE
6 VALPARAISO SW NE
7 VALPARAISO NW
8 VALPARAISO NE

INDEX TO ADJOINING 3.75 MAPS

TOUHY SW, NEBRASKA
3.75 MINUTE SERIES
SHEET NUMBER 43 OF 72

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

96° 48′45″ R. 5 E. R. 6 E. (Joins sheet 34) 96° 45′00″

41° 11′15″ 41° 11′15″

(Joins sheet 43) (Joins sheet 45)

T. 14 N. T. 13 N. T. 14 N. T. 13 N.

41° 07′30″ R. 5 E. R. 6 E. (Joins sheet 54) 41° 07′30″

96° 48′45″ 96° 45′00″

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North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

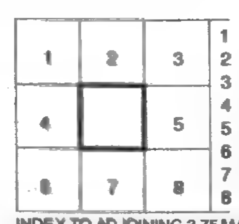
QUARTER QUADRANGLE LOCATION

SCALE 1:12000

0.5 0 0.5
MILES

500 0 500 1000 1500 2000 2500 3000 3500
FEET

0.5 0 0.5
KILOMETERS



1 TOUHY NW
2 TOUHY NE
3 WAHOO WEST NW
4 TOUHY SW
5 WAHOO WEST SW
6 VALPARAISO NW
7 VALPARAISO NE
8 CERESCO NW

INDEX TO ADJOINING 3.75 MAPS

TOUHY SE, NEBRASKA
3.75 MINUTE SERIES
SHEET NUMBER 44 OF 72

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

96° 45′00″ R. 6 E. (Joins sheet 35) 96° 41′15″

41° 11′15″

41° 07′30″ 41° 07′30″
96° 45′00″ R. 6 E. (Joins sheet 55) 96° 41′15″

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North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUARTER QUADRANGLE LOCATION

SCALE 1:12000

0.5 0 0.5
MILES

500 0 500 1000 1500 2000 2500 3000 3500
FEET

0.5 0 0.5
KILOMETERS

1	2	3
4		5
6	7	8

1 TOUHY NE
2 WAHOO WEST NW
3 WAHOO WEST NE
4 TOUHY SE
5 WAHOO WEST SE
6 VALPARAISO NE
7 CERESCO NW
8 CERESCO NE

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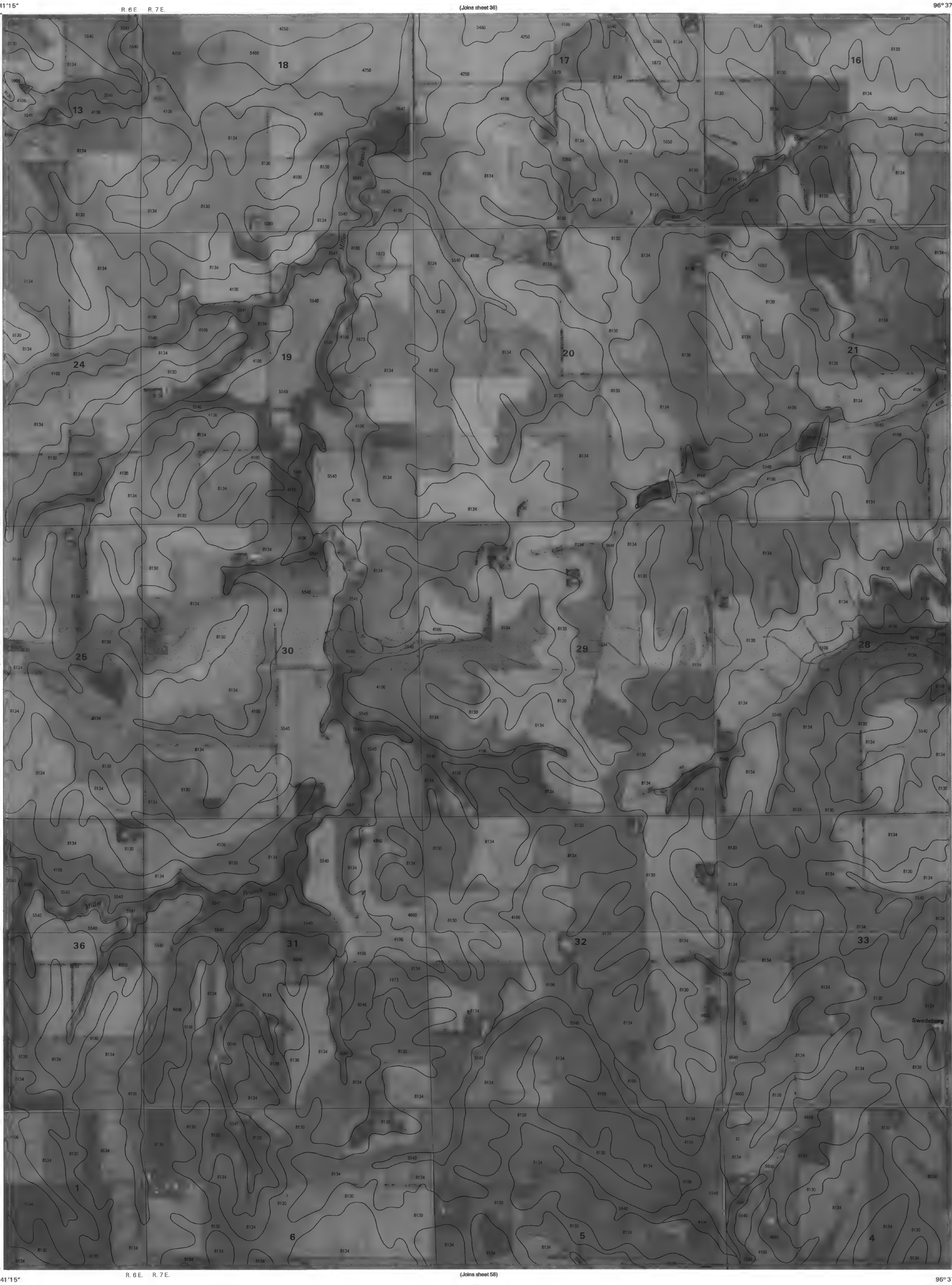
WAHOO WEST SW, NEBRASKA
3.75 MINUTE SERIES
SHEET NUMBER 45 OF 72

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

SAUNDERS COUNTY, NEBRASKA
WAHOO WEST SE QUADRANGLE
SHEET NUMBER 46 OF 72

96° 41'15" 41° 11'15" R. 6 E. R. 7 E. (Joins sheet 36) 96° 37'30" 41° 11'15"



41° 07'30" 96° 41'15" R. 6 E. R. 7 E. (Joins sheet 56) 41° 07'30" 96° 37'30"

SCALE 1:12000

This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service, formerly Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 1992-1994 aerial photography.

North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUADRANGLE LOCATION

0.5 0 0.5
MILES

500 0 500 1000 1500 2000 2500 3000 3500
FEET

0.5 0 0.5
KILOMETERS

1	2	3
4		5
6	7	8

1 WAHOO WEST NW
2 WAHOO WEST NE
3 WAHOO EAST NW
4 WAHOO WEST SW
5 WAHOO EAST SW
6 CERESCO NW
7 CERESCO NE
8 WAHOO SE NW

INDEX TO ADJOINING 3.75 MAPS

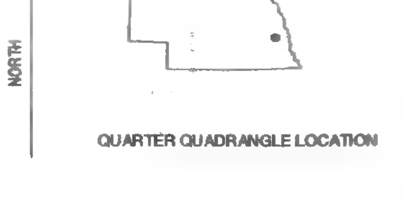
WAHOO WEST SE, NEBRASKA
3.75 MINUTE SERIES
SHEET NUMBER 46 OF 72

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

SAUNDERS COUNTY, NEBRASKA
WAHOO EAST SW QUADRANGLE
SHEET NUMBER 47 OF 72

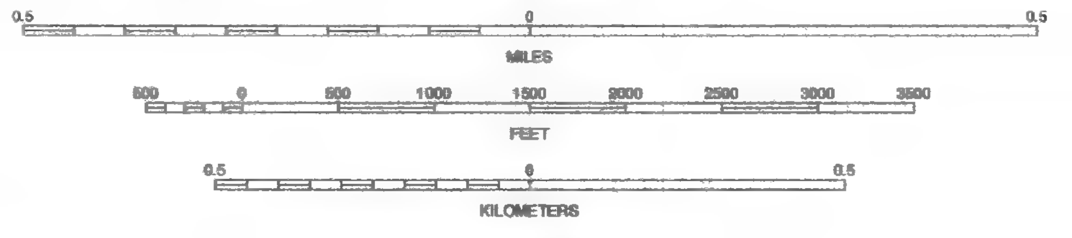
This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service, formerly Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 1992-1994 aerial photography.

North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.



QUARTER QUADRANGLE LOCATION

SCALE 1:12000



1	2	3
4		5
6	7	8

1 WAHOO WEST NE
2 WAHOO EAST NW
3 WAHOO EAST NE
4 WAHOO WEST SE
5 WAHOO EAST SE
6 CERESCO NE
7 WAHOO SE NW
8 WAHOO SE NE

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WAHOO EAST SW, NEBRASKA
3.75 MINUTE SERIES
SHEET NUMBER 47 OF 72

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

SAUNDERS COUNTY, NEBRASKA
WAHOO EAST SE QUADRANGLE
SHEET NUMBER 48 OF 72

96° 33′ 45″ 41° 11′ 15″ (Joins sheet 38) R. 8 E. 96° 30′ 00″ 41° 11′ 15″

T. 14 N.
T. 13 N.

41° 07′ 30″ 96° 33′ 45″ (Joins sheet 58) R. 8 E. 41° 07′ 30″ 96° 30′ 00″

This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service, formerly Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 1992-1994 aerial photography.

North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUARTER QUADRANGLE LOCATION

SCALE 1:12000

0.5 0 0.5
MILES

500 0 500 1000 1500 2000 2500 3000 3500
FEET

0.5 0 0.5
KILOMETERS

SAUNDERS COUNTY, NEBRASKA NO. 48

1	2	3
4		5
6	7	8

1 WAHOO EAST NW
2 WAHOO EAST NE
3 MEAD NW
4 WAHOO EAST SW
5 MEAD SW
6 WAHOO SE NW
7 WAHOO SE NE
8 ASHLAND WEST NW

INDEX TO ADJOINING 3.75 MAPS

WAHOO EAST SE, NEBRASKA
3.75 MINUTE SERIES
SHEET NUMBER 48 OF 72

96° 30′00″ 41° 11′15″ (Joins sheet 39) R. 8 E. R. 9 E. 96° 26′15″ 41° 11′15″

41° 07′30″ 96° 30′00″ (Joins sheet 59) R. 8 E. R. 9 E. 41° 07′30″ 96° 26′15″

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North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUARTER QUADRANGLE LOCATION

SCALE 1:12000

0.5 0 0.5
MILES

500 0 500 1000 1500 2000 2500 3000 3500
FEET

0.5 0 0.5
KILOMETERS

1	2	3
4		5
6	7	8

1 WAHOO EAST NE
2 MEAD NW
3 MEAD NE
4 WAHOO EAST SE
5 MEAD SE
6 WAHOO SE NE
7 ASHLAND WEST NW
8 ASHLAND WEST NE

INDEX TO ADJOINING 3.75 MAPS

MEAD SW, NEBRASKA
3.75 MINUTE SERIES
SHEET NUMBER 49 OF 72

96° 26′15″ 41° 11′15″

R. 9 E. (Joins sheet 40)

96° 22′30″ 41° 11′15″

(Joins sheet 49)

(Joins sheet 51)

T. 14 N.
T. 13 N.

41° 07′30″ 96° 26′15″

R. 9 E. (Joins sheet 60)

41° 07′30″ 96° 22′30″

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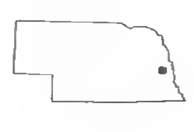
North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



QUARTER QUADRANGLE LOCATION

SCALE 1:12000

0.5 0 0.5
MILES

500 0 500 1000 1500 2000 2500 3000 3500
FEET

0.5 0 0.5
KILOMETERS

1	2	3
4		5
6	7	8

1 MEAD NW
2 MEAD NE
3 WANN NW
4 MEAD SW
5 WANN SW
6 ASHLAND WEST NW
7 ASHLAND WEST NE
8 ASHLAND EAST NW

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MEAD SE, NEBRASKA
3.75 MINUTE SERIES
SHEET NUMBER 50 OF 72

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

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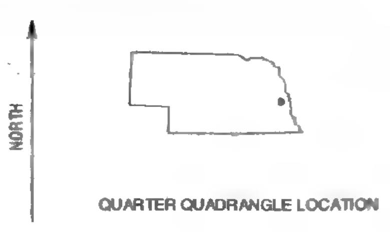
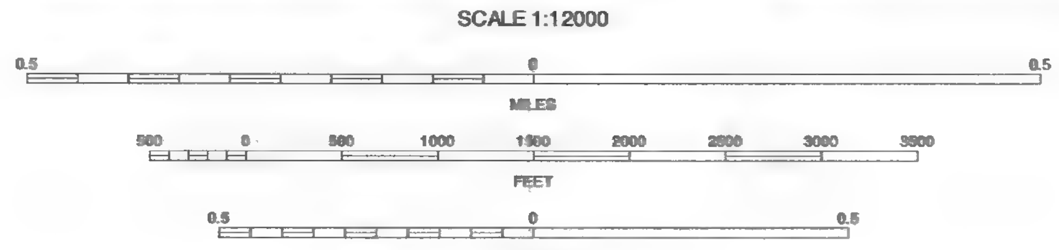
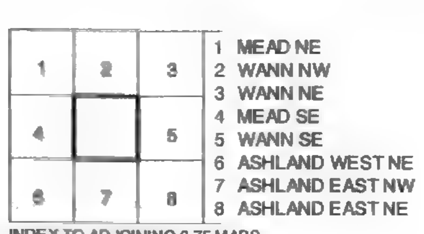
North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.



SCALE 1:12000





WANN SW, NEBRASKA
3.75 MINUTE SERIES
SHEET NUMBER 51 OF 72

This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service, formerly Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 1992-1994 aerial photography.

North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

QUARTER QUADRANGLE LOCATION

SCALE 1:12000

0.5	0	0.5

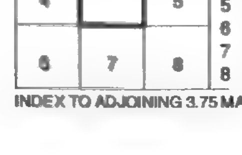
MILES

500	0	500	1000	1500	2000	2500	3000	3500

FEET

0.5	0	0.5

KILOMETERS



1 LOMA SW
2 LOMA SE
3 TOUHY SW
4 VALPARAISO SW NW
5 VALPARAISO NW
6 VALPARAISO SW SW
7 VALPARAISO SW SE
8 VALPARAISO SW

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VALPARAISO SW NE, NEBRASKA
3.75 MINUTE SERIES
SHEET NUMBER 52 OF 72

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

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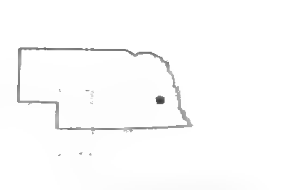
North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



QUARTER QUADRANGLE LOCATION

SCALE 1:12000

0.5 0 0.5
MILES

500 0 500 1000 1500 2000 2500 3000 3500
FEET

0.5 0 0.5
KILOMETERS

1	2	3
4		5
6	7	8

1 LOMA SE
2 TOUHY SW
3 TOUHY SE
4 VALPARAISO SW NE
5 VALPARAISO NE
6 VALPARAISO SW SE
7 VALPARAISO SW
8 VALPARAISO SE

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VALPARAISO NW, NEBRASKA
3.75 MINUTE SERIES
SHEET NUMBER 53 OF 72

96° 48′45″ — 96° 45′00″
41° 07′30″

R. 5 E. R. 6 E.

(Joins sheet 44)

(Joins sheet 53)

(Joins sheet 55)

T. 13 N.

41° 03′45″
96° 48′45″ — 96° 45′00″

R. 5 E. R. 6 E.

(Joins sheet 65)

SCALE 1:12000

0.5 0 0.5
MILES

500 0 500 1000 1500 2000 2500 3000 3500
FEET

0.5 0 0.5
KILOMETERS

This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service, formerly Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 1992-1994 aerial photography.

North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUARTER QUADRANGLE LOCATION

1	2	3
4		5
6	7	8

1 TOUHY SW
2 TOUHY SE
3 WAHOO WEST SW
4 VALPARAISO NW
5 CERESCO NW
6 VALPARAISO SW
7 VALPARAISO SE
8 CERESCO SW

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VALPARAISO NE, NEBRASKA
3.75 MINUTE SERIES
SHEET NUMBER 54 OF 72

UNITED STATES
DEPARTMENT OF AGRICULTURE
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SAUNDERS COUNTY, NEBRASKA
CERESCO NW QUADRANGLE
SHEET NUMBER 55 OF 72

96° 45′00″ R. 6 E. (Joins sheet 45) 96° 41′15″

41° 07′30″ 41° 07′30″

(Joins sheet 54) (Joins sheet 56)

T. 13 N. T. 13 N.

41° 03′45″ 41° 03′45″

96° 45′00″ R. 6 E. (Joins sheet 66) 96° 41′15″

This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service, formerly Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 1992-1994 aerial photography.

North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUARTER QUADRANGLE LOCATION

SCALE 1:12000

0.5 0 0.5
MILES

500 0 500 1000 1500 2000 2500 3000 3500
FEET

0.5 0 0.5
KILOMETERS

1	2	3
4		5
6	7	8

1 TOUHY SE
2 WAHOO WEST SW
3 WAHOO WEST SE
4 VALPARAISO NE
5 CERESCO NE
6 VALPARAISO SE
7 CERESCO SW
8 CERESCO SE

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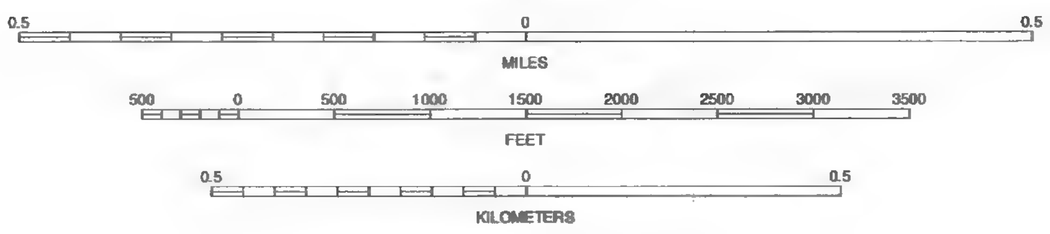
CERESCO NW, NEBRASKA
3.75 MINUTE SERIES
SHEET NUMBER 55 OF 72

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

SAUNDERS COUNTY, NEBRASKA
CERESCO NE QUADRANGLE
SHEET NUMBER 56 OF 72

SCALE 1:12000



This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service, formerly Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 1992-1994 aerial photography.

North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

1	2	3
4		5
6	7	8

1 WAHOO WEST SW
2 WAHOO WEST SE
3 WAHOO EAST SW
4 CERESCO NW
5 WAHOO SE NW
6 CERESCO SW
7 CERESCO SE
8 WAHOO SE SW

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CERESCO NE, NEBRASKA
3.75 MINUTE SERIES
SHEET NUMBER 56 OF 72

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

SAUNDERS COUNTY, NEBRASKA
WAHOO SE NW QUADRANGLE

96° 37′ 30″ 41° 07′ 30″

(Joins sheet 47)

96° 33′ 45″ R. 7 E. R. 8 E. 41° 07′ 30″

41° 03′ 45″ 96° 37′ 30″

(Joins sheet 68)

41° 03′ 45″ R. 7 E. R. 8 E. 96° 33′ 45″

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North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUARTER QUADRANGLE LOCATION

SCALE 1:12000

0.5 0 0.5
MILES

500 0 500 1000 1500 2000 2500 3000 3500
FEET

0.5 0 0.5
KILOMETERS

1	2	3
4		5
6	7	8

1 WAHOO WEST SE
2 WAHOO EAST SW
3 WAHOO EAST SE
4 CERESCO NE
5 WAHOO SE NE
6 CERESCO SE
7 WAHOO SE SW
8 WAHOO SE SE

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WAHOO SE NW, NEBRASKA
3.75 MINUTE SERIES
SHEET NUMBER 57 OF 72

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

SAUNDERS COUNTY, NEBRASKA
WAHOO SE NE QUADRANGLE
SHEET NUMBER 58 OF 72

96°33'45"   (Joins sheet 48)   R. 8 E.   96°30'00"
41°07'30"   41°07'30"

(Joins sheet 57)   T. 13 N.

T. 13 N.   (Joins sheet 59)

41°03'45"   41°03'45"
96°33'45"   (Joins sheet 69)   R. 8 E.   96°30'00"

This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service, formerly Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 1992-1994 aerial photography.

North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUARTER QUADRANGLE LOCATION

SCALE 1:12000

0.5   0   0.5
MILES

500   0   500   1000   1500   2000   2500   3000   3500
FEET

0.5   0   0.5
KILOMETERS

1	2	3
4		5
6	7	8

1 WAHOO EAST SW
2 WAHOO EAST SE
3 MEAD SW
4 WAHOO SE NW
5 ASHLAND WEST NW
6 WAHOO SE SW
7 WAHOO SE SE
8 ASHLAND WEST SW

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WAHOO SE NE, NEBRASKA
3.75 MINUTE SERIES
SHEET NUMBER 58 OF 72

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

SAUNDERS COUNTY, NEBRASKA
ASHLAND WEST NW QUADRANGLE
SHEET NUMBER 59 OF 72

SCALE 1:12000

MILES

FEET

KILOMETERS

This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service, formerly Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 1992-1994 aerial photography.

North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUARTER QUADRANGLE LOCATION

1 WAHOO EAST SE
2 MEAD SW
3 MEAD SE
4 WAHOO SE NE
5 ASHLAND WEST NE
6 WAHOO SE SE
7 ASHLAND WEST SW
8 ASHLAND WEST SE

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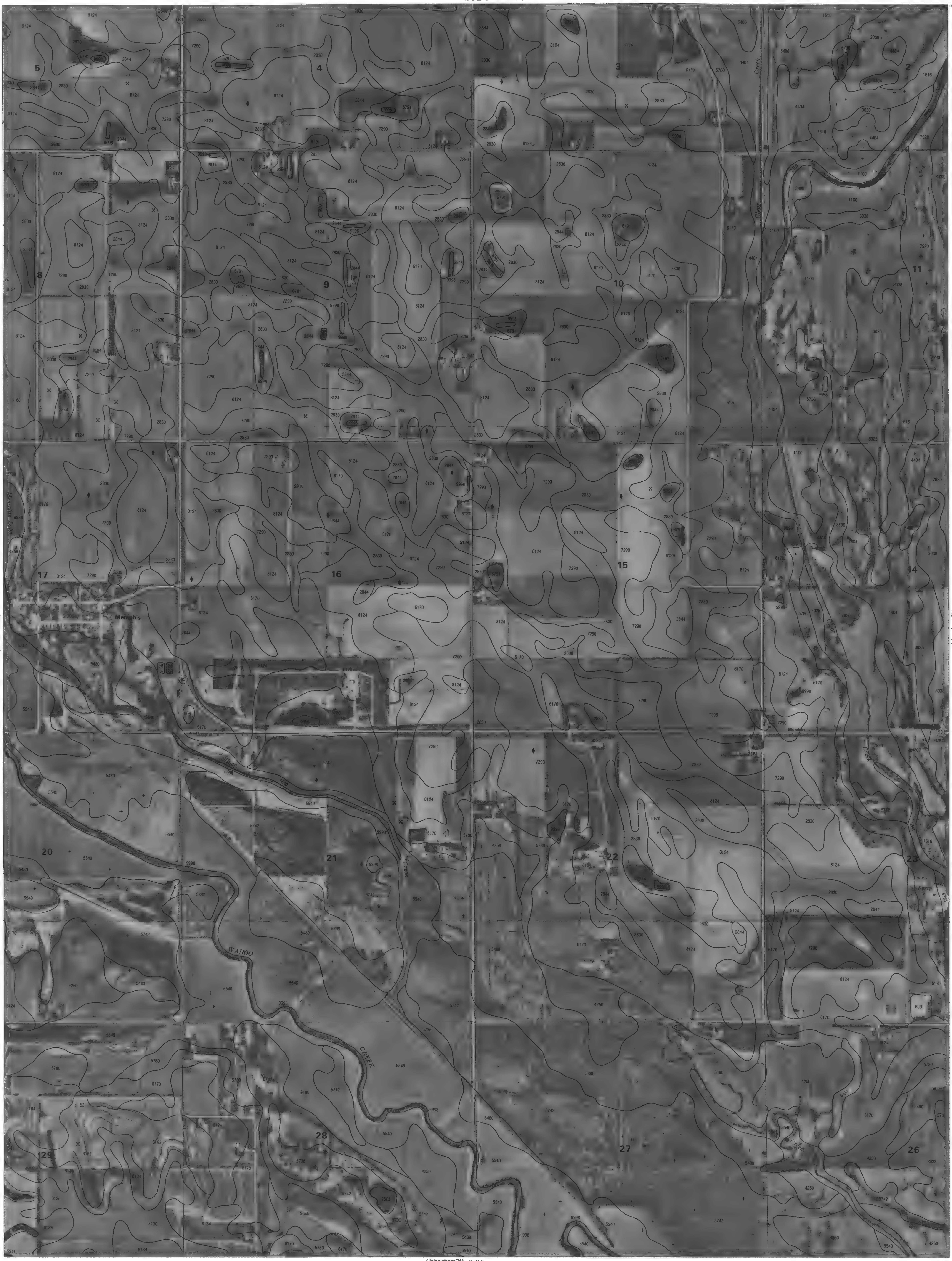
ASHLAND WEST NW, NEBRASKA
3.75 MINUTE SERIES
SHEET NUMBER 59 OF 72

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

SAUNDERS COUNTY, NEBRASKA
ASHLAND WEST NE QUADRANGLE
SHEET NUMBER 60 OF 72

96°26'15" R. 9 E. (Joins sheet 50) 96°22'30"
41°07'30" 41°07'30"



41°03'45" (Joins sheet 71) R. 9 E. 41°03'45"
96°26'15" 96°22'30"

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North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUARTER QUADRANGLE LOCATION

SCALE 1:12000

0.5 0 0.5
MILES

500 0 500 1000 1500 2000 2500 3000 3500
FEET

0.5 0 0.5
KILOMETERS

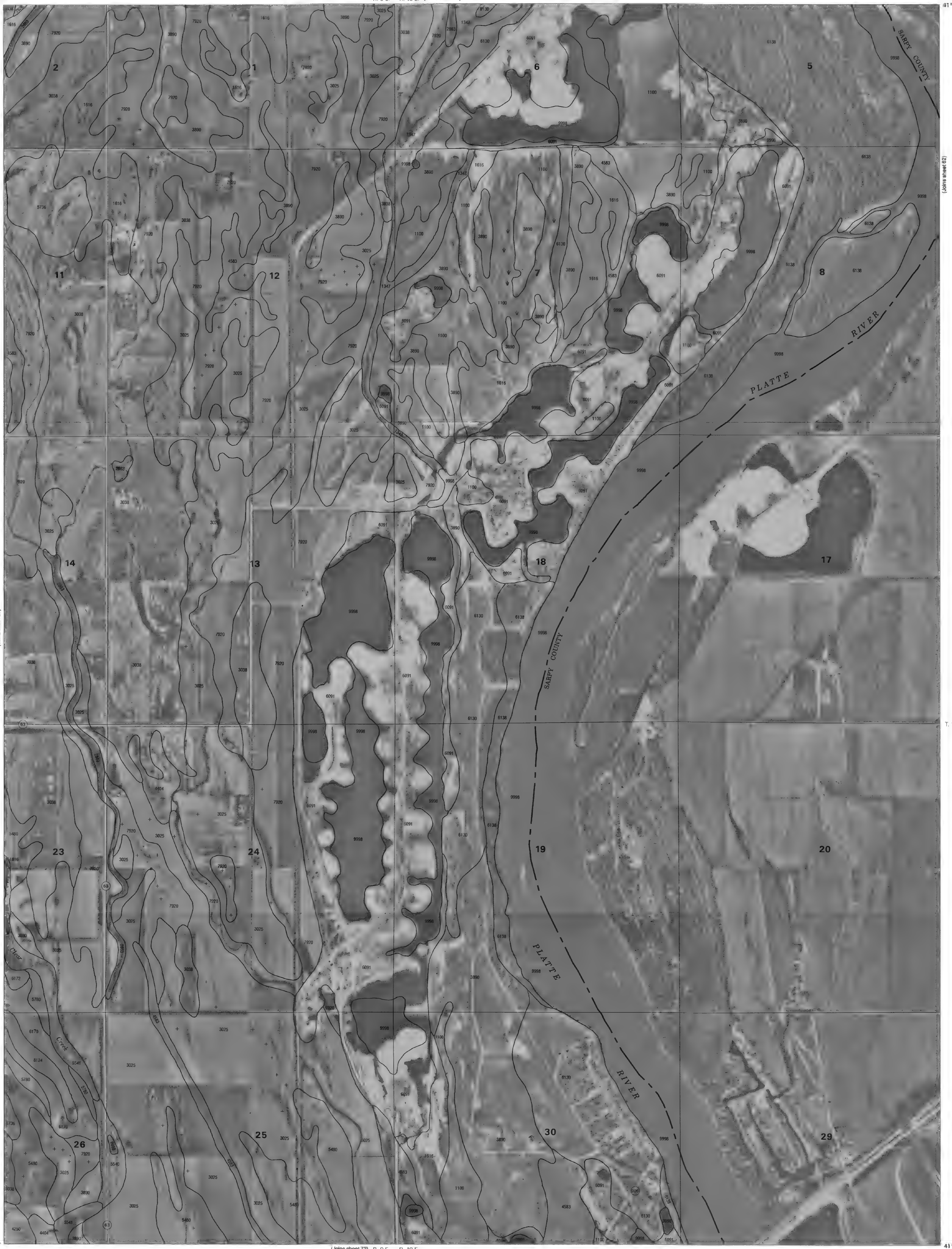
1	2	3
4		5
6	7	8

1 MEAD SW
2 MEAD SE
3 WANN SW
4 ASHLAND WEST NW
5 ASHLAND EAST NW
6 ASHLAND WEST SW
7 ASHLAND WEST SE
8 ASHLAND EAST SW

INDEX TO ADJOINING 3.75 MAPS

ASHLAND WEST NE, NEBRASKA
3.75 MINUTE SERIES
SHEET NUMBER 60 OF 72

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE



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North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUARTER QUADRANGLE LOCATION

SCALE 1:12000

0.5 0 0.5
MILES

500 0 500 1000 1500 2000 2500 3000 3500
FEET

0.5 0 0.5
KILOMETERS

1	2	3	1 MEAD SE 2 WANN SW 3 WANN SE
4		5	4 ASHLAND WEST NE 5 ASHLAND EAST NE 6 ASHLAND WEST SE
6	7	8	7 ASHLAND EAST SW 8 ASHLAND EAST SE

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ASHLAND EAST NW, NEBRASKA
3.75 MINUTE SERIES
SHEET NUMBER 61 OF 72

96°18'45" 41°07'30" R. 10 E. 96°15'00" 41°07'30"

T. 13 N.

41°03'45" 96°18'45" R. 10 E. 41°03'45" 96°15'00"

SCALE 1:12000

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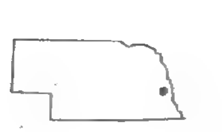
North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



QUARTER QUADRANGLE LOCATION

0.5 0 0.5
MILES

500 0 500 1000 1500 2000 2500 3000 3500
FEET

0.5 0 0.5
KILOMETERS

1	2	3
4		5
6	7	8

1 WANN SW
2 WANN SE
3 GRETNA SW
4 ASHLAND EAST NW
5 SPRINGFIELD NW
6 ASHLAND EAST SW
7 ASHLAND EAST SE
8 SPRINGFIELD SW

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ASHLAND EAST NE, NEBRASKA
3.75 MINUTE SERIES
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UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

SAUNDERS COUNTY, NEBRASKA
VALPARAISO SW SE QUADRANGLE
SHEET NUMBER 63 OF 72

96°56'15"　R. 4 E.　R. 5 E.　96°52'30"

41°03'45"　41°03'45"

T. 13 N.
T. 12 N.

T. 13 N.
T. 12 N.

41°00'00"　41°00'00"
96°56'15"　R. 4 E.　R. 5 E.　96°52'30"

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North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUARTER QUADRANGLE LOCATION

SCALE 1:12000

0.5　0　0.5
MILES

500　0　500　1000　1500　2000　2500　3000　3500
FEET

0.5　0　0.5
KILOMETERS

SAUNDERS COUNTY, NEBRASKA NO. 63

1	2	3	1 VALPARAISO SW NW 2 VALPARAISO SW NE 3 VALPARAISO NW
4		5	4 VALPARAISO SW SW 5 VALPARAISO SW
6	7	8	6 GARLAND NW 7 GARLAND NE 8 RAYMOND NW

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VALPARAISO SW SE, NEBRASKA
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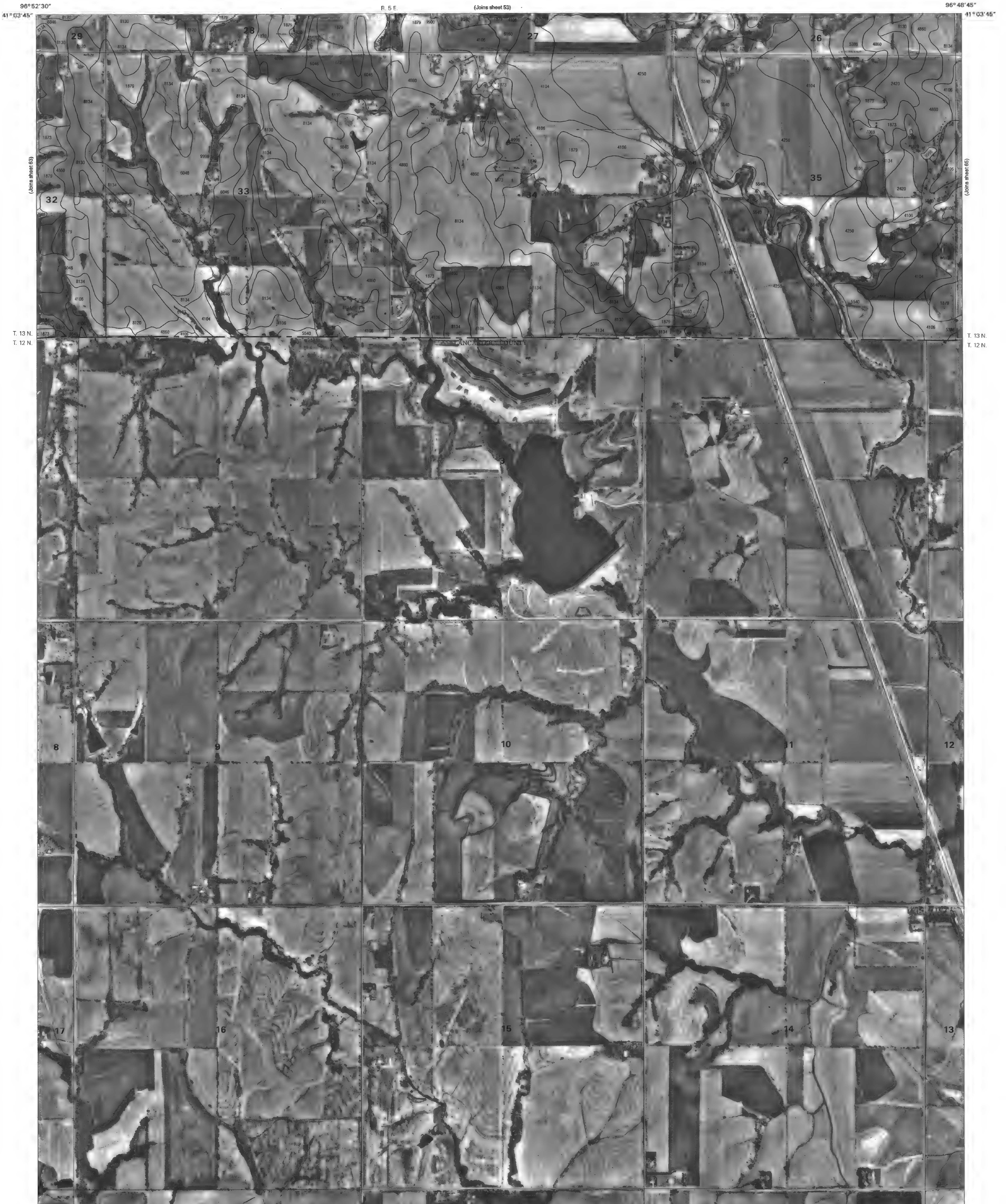
UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE



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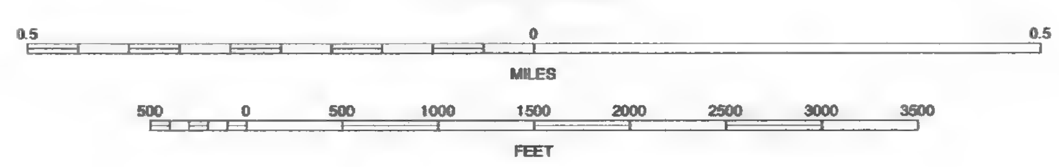
North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

QUARTER QUADRANGLE LOCATION

SCALE 1:12000



1	2	3
4		5
6	7	8

1 VALPARAISO SW NE
2 VALPARAISO NW
3 VALPARAISO NE
4 VALPARAISO SW SE
5 VALPARAISO SE
6 GARLAND NE
7 RAYMOND NW
8 RAYMOND NE

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VALPARAISO SW, NEBRASKA
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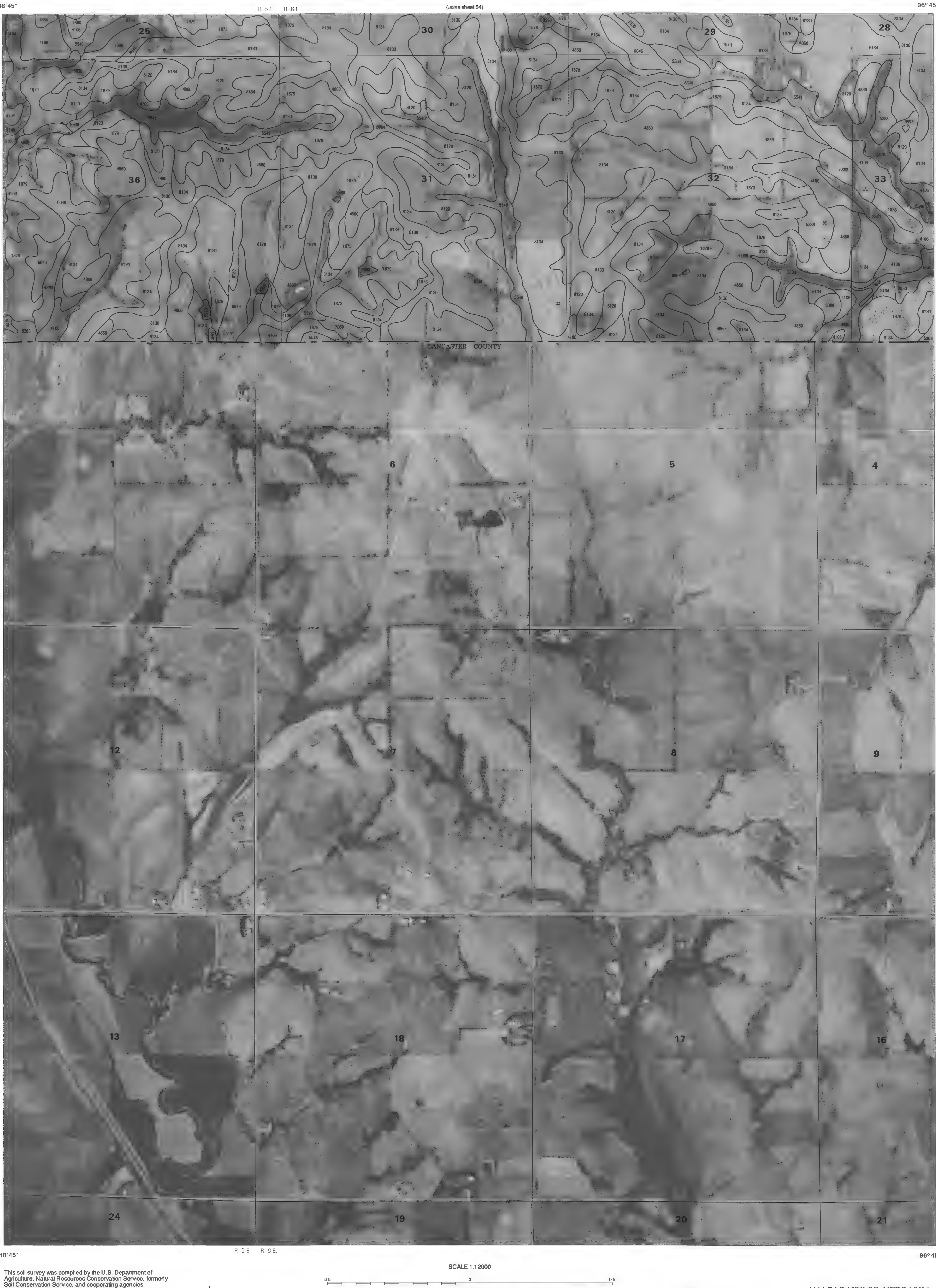
SHEET NUMBER 64 OF 72

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE



This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service, formerly Soil Conservation Service, and cooperating agencies. Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 1992-1994 aerial photography.

North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUARTER QUADRANGLE LOCATION

SCALE 1:12000

0.5 0 0.5
MILES

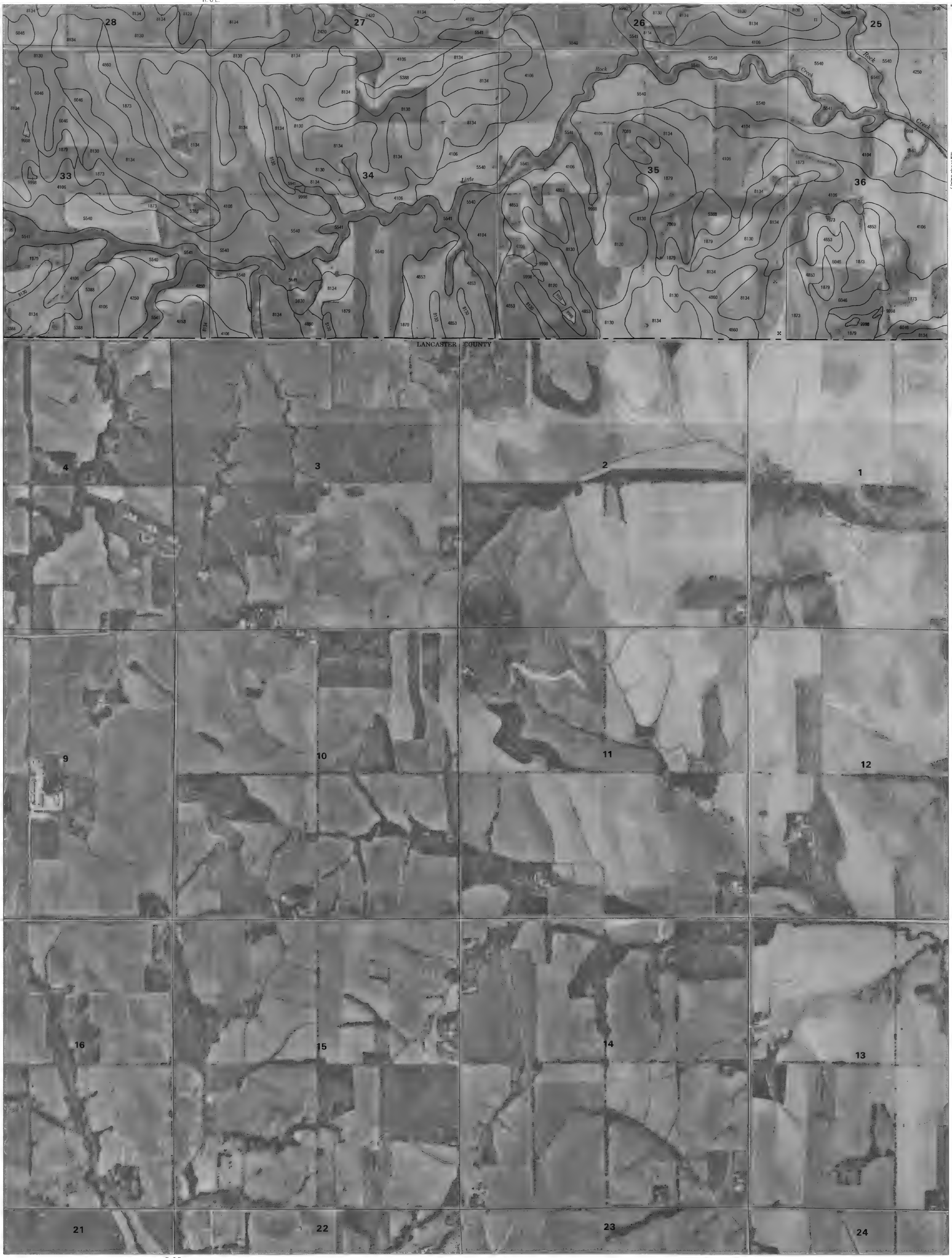
500 0 500 1000 1500 2000 2500 3000 3500
FEET

0.5 0 0.5
KILOMETERS

1	2	3	1 VALPARAISO NW
			2 VALPARAISO NE
4		5	3 CERESCO NW
			4 VALPARAISO SW
6	7	8	5 CERESCO SW
			6 RAYMOND NW
			7 RAYMOND NE
			8 DAVEY NW

INDEX TO ADJOINING 3.75 MAPS

VALPARAISO SE, NEBRASKA
3.75 MINUTE SERIES
SHEET NUMBER 65 OF 72



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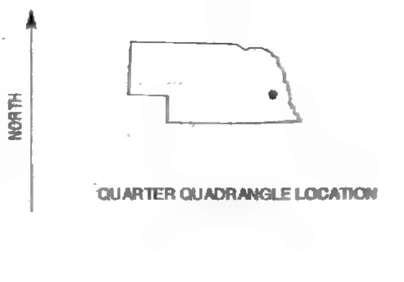

SCALE 1:12000

0.5 0 0.5 MILES

500 0 500 1000 1500 2000 2500 3000 3500 FEET

0.5 0 0.5 KILOMETERS

1	2	3
4		5
6	7	8

1 VALPARAISO NE
2 CERESCO NW
3 CERESCO NE
4 VALPARAISO SE
5 CERESCO SE
6 RAYMOND NE
7 DAVEY NW
8 DAVEY NE

INDEX TO ADJOINING 3.75 MAPS

CERESCO SW, NEBRASKA
3.75 MINUTE SERIES
SHEET NUMBER 66 OF 72

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

SAUNDERS COUNTY, NEBRASKA
CERESCO SE QUADRANGLE
SHEET NUMBER 67 OF 72

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North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUARTER QUADRANGLE LOCATION

SCALE 1:12000

0.5 0 0.5
MILES

500 0 500 1000 1500 2000 2500 3000 3500
FEET

0.5 0 0.5
KILOMETERS

1	2	3
4		5
6	7	8

1 CERESCO NW
2 CERESCO NE
3 WAHOO SE NW
4 CERESCO SW
5 WAHOO SE SW
6 DAVEY NW
7 DAVEY NE
8 WAVERLY NW

INDEX TO ADJOINING 3.75 MAPS

CERESCO SE, NEBRASKA
3.75 MINUTE SERIES
SHEET NUMBER 67 OF 72

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

SAUNDERS COUNTY, NEBRASKA
WAHOO SE SW QUADRANGLE
SHEET NUMBER 68 OF 72

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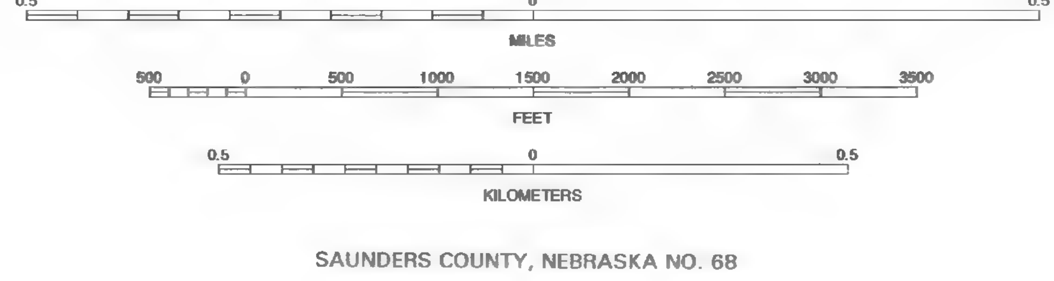
SCALE 1:12000



SAUNDERS COUNTY, NEBRASKA NO. 68

1	2	3
4		5
6	7	8

1 CERESCO NE
2 WAHOO SE NW
3 WAHOO SE NE
4 CERESCO SE
5 WAHOO SE SE
6 DAVEY NE
7 WAVERLY NW
8 WAVERLY NE

INDEX TO ADJOINING 3.75 MAPS

WAHOO SE SW, NEBRASKA
3.75 MINUTE SERIES
SHEET NUMBER 68 OF 72

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

SAUNDERS COUNTY, NEBRASKA
WAHOO SE SE QUADRANGLE
SHEET NUMBER 69 OF 72

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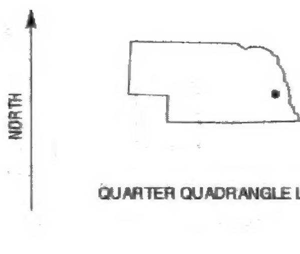

QUARTER QUADRANGLE LOCATION

SCALE 1:12000

0.5 0 0.5
MILES

500 0 500 1000 1500 2000 2500 3000 3500
FEET

0.5 0 0.5
KILOMETERS

1	2	3
4		5
6	7	8

1 WAHOO SE NW
2 WAHOO SE NE
3 ASHLAND WEST NW
4 WAHOO SE SW
5 ASHLAND WEST SW
6 WAVERLY NW
7 WAVERLY NE
8 GREENWOOD NW

INDEX TO ADJOINING 3.75 MAPS

WAHOO SE SE, NEBRASKA
3.75 MINUTE SERIES
SHEET NUMBER 69 OF 72

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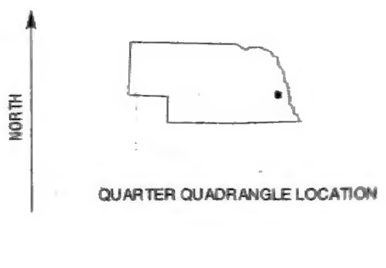
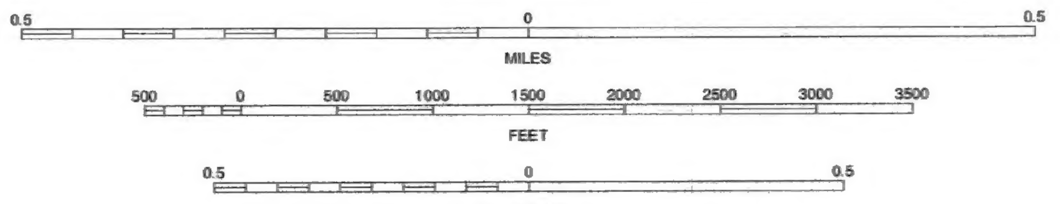


QUARTER QUADRANGLE LOCATION

SCALE 1:12000



1	2	3
4		5
6	7	8

1 WAHOO SE NE
2 ASHLAND WEST NW
3 ASHLAND WEST NE
4 WAHOO SE SE
5 ASHLAND WEST SE
6 WAVERLY NE
7 GREENWOOD NW
8 GREENWOOD NE

INDEX TO ADJOINING 3.75 MAPS

ASHLAND WEST SW, NEBRASKA
3.75 MINUTE SERIES
SHEET NUMBER 70 OF 72

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

SAUNDERS COUNTY, NEBRASKA
ASHLAND WEST SE QUADRANGLE
SHEET NUMBER 71 OF 72

96° 26'15" — 41° 03'45"
(Joins sheet 60) R. 9 E.
96° 22'30" — 41° 03'45"

T. 13 N.
T. 12 N.

(Joins sheet 70)

(Joins sheet 72)

41° 00'00" 96° 26'15"
R. 9 E.
41° 00'00" 96° 22'30"

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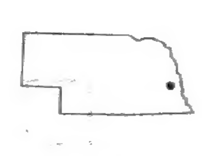
North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



QUARTER QUADRANGLE LOCATION

SCALE 1:12000

0.5 0 0.5
MILES

500 0 500 1000 1500 2000 2500 3000 3500
FEET

0.5 0 0.5
KILOMETERS

1	2	3
4		5
6	7	8

1 ASHLAND WEST NW
2 ASHLAND WEST NE
3 ASHLAND EAST NW
4 ASHLAND WEST SW
5 ASHLAND EAST SW
6 GREENWOOD NW
7 GREENWOOD NE
8 MURDOCK NW

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ASHLAND WEST SE, NEBRASKA
3.75 MINUTE SERIES
SHEET NUMBER 71 OF 72

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

SAUNDERS COUNTY, NEBRASKA
ASHLAND EAST SW QUADRANGLE
SHEET NUMBER 72 OF 72

96° 22′30″ (Joins sheet 61) R. 9 E. R. 10 E. 96° 18′45″

41° 03′45″ 41° 03′45″

41° 00′00″ R. 9 E. R. 10 E. 41° 00′00″
96° 22′30″ 96° 18′45″

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North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 14. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUARTER QUADRANGLE LOCATION

SCALE 1:12000

0.5 0 0.5
MILES

500 0 500 1000 1500 2000 2500 3000 3500
FEET

0.5 0 0.5
KILOMETERS

1	2	3
4		5
6	7	8

1 ASHLAND WEST NE
2 ASHLAND EAST NW
3 ASHLAND EAST NE
4 ASHLAND WEST SE
5 ASHLAND EAST SE
6 GREENWOOD NE
7 MURDOCK NW
8 MURDOCK NE

INDEX TO ADJOINING 3.75 MAPS

ASHLAND EAST SW, NEBRASKA
3.75 MINUTE SERIES
SHEET NUMBER 72 OF 72